

GAO 118790

BY THE COMPTROLLER GENERAL

Report To The Congress

OF THE UNITED STATES

Developing Alaska's Energy Resources: Actions Needed To Stimulate Research And Improve Wetlands Permit Processing

Additional research is needed to evaluate the impacts of oil and gas-related activity in Alaska as a basis for promoting environmentally sound approaches to future development without unnecessarily increasing its cost. Such efforts should provide site-specific data to allow the tailoring of protection measures suitable for the areas to which they are applied, and to minimize universal or blanket stipulations where they are not necessary.

The Corps of Engineers has been slow in processing wetlands permits, required for many oil and gas projects in Alaska, and has frequently included controversial and costly conditions--such as seasonal drilling and waste disposal restrictions--in its permits, without requiring substantiation of their need through research findings and site-specific data.

Congress should provide for three critical elements--coordination, prioritization, and a source of funding--when considering legislation to establish an Arctic research policy, and Federal and State agencies should use research findings and site-specific data to the maximum extent possible in support of permit stipulations.



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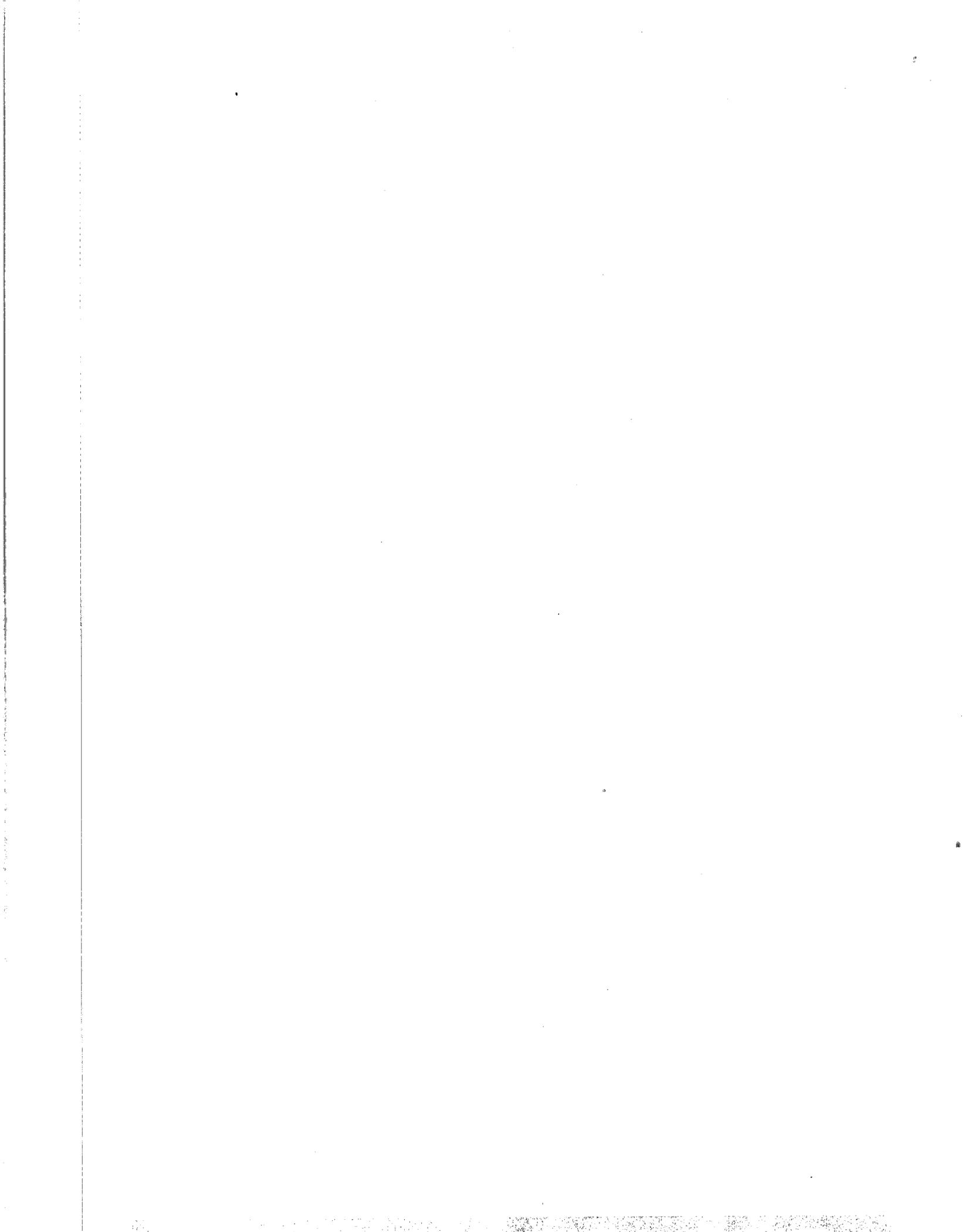
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To the President of the Senate and the
Speaker of the House of Representatives

This report identifies a need for additional Arctic research and calls for changes in the Corps of Engineers' wetlands permitting process. We conducted this review to determine the effectiveness of Federal agencies' efforts to minimize the negative environmental impacts of oil and gas-related activities on Federal lands in Alaska.

We are sending copies of this report to the Director, Office of Management and Budget; the Secretary of the Interior; and the Secretary of the Army.

Charles A. Bowser
Comptroller General
of the United States



D I G E S T

Alaska's Federal lands are rich in energy, wild-
life, and scenic resources. Energy exploration
and development in this unique environment has
given rise to elaborate, costly, and sometimes
controversial measures designed to minimize
negative impact.

To determine if Federal agencies are advancing
environmentally sound approaches to energy
exploration and development, without unnecessar-
ily increasing energy costs, GAO

- analyzed the results of oil and gas-related
experience on the Kenai National Wildlife
Refuge, the only Federal land in Alaska where
significant production has occurred (see p. 5);
- evaluated measures used in Alaska prohibiting
exploratory drilling during certain months of
the year (see p. 15) and controlling drilling
waste disposal (see p. 20);
- evaluated the adequacy of research to lessen
the impacts of energy development (see p. 22);
and
- evaluated wetlands permitting, which is of
crucial importance to energy development
on all Alaskan lands (see p. 27).

NEED FOR ENVIRONMENTAL IMPACT
RESEARCH AND SITE-SPECIFIC KNOWLEDGE
FOR EFFECTIVE REGULATION
OF ENERGY DEVELOPMENT

Additional research is needed to evaluate the
effect energy exploration and development has
had on Alaskan Federal lands. Increased site-
specific research and knowledge are necessary
to assure that cost-effective and environmentally
sound impact mitigation techniques are utilized,
as demonstrated with the management of oil and

gas activities on the Kenai National Wildlife Refuge. The research itself is costly, however, and should be planned and coordinated with existing efforts.

GAO found that two costly and controversial restrictions were being widely applied to energy exploration in the Arctic. Currently, offshore oil and gas drilling is only allowed during five months of the winter with little flexibility for start and completion dates. The seasonal drilling restriction, while initially developed for offshore drilling, is now being applied to onshore activities. The second restriction requires the disposal of drilling waste in impermeable pits, even though some Government and industry officials believe it may not always be necessary. GAO found that inadequate research exists to support either the imposition or removal of these restrictions.

Site-specific research findings would allow refinement of environmental protection controls suitable to the unique characteristics of the lands to which they are applied. Gathering of site-specific data to allow application on a case-by-case basis, followed by impact-related research to further refine controlling stipulations, could allow energy exploration to proceed on a more timely and less costly basis. Research should also facilitate opening lands to exploration, enhance production possibilities, and increase expected Federal revenues.

GAO's findings are particularly pertinent to the Congress in its consideration of recently proposed legislation with regard to Arctic research. S.1562, would prioritize, fund (using a small portion of revenues from leasing Federal lands on the North Slope--both offshore and onshore), and coordinate Arctic research. Thus, it could help fill the research gaps identified in this and previous reports--but any research funded by the Federal Government should be subject to the budget process. (See pp. 24-26.)

WETLANDS PERMITS: DELAYS AND
CONTROVERSIAL STIPULATIONS

Wetlands permits are required for many Alaska oil and gas projects. Consequently, the permit issuing agency--the U.S. Army Corps of Engineers--has become of primary importance to Alaskan energy development. Costs of this development have increased because the Corps has been late in meeting goals established for processing wetlands permits. For example, of the 167 permits GAO reviewed, 127 were late when compared to the Clean Water Act issuance goal of 105 days. The average issuance time for fiscal year 1981 permits was 152 days.

Delayed public notices and automatic extensions to agency comment periods caused significant portions of permit processing delays. The Corps' Alaska District has not, on the average, issued public notices within the 15-day period specified by law. Delays also occurred because of extensions to the 30-day public comment period. About 51 percent of the permits reviewed involved comment period extensions, most of them requested by the State of Alaska.

In addition, the Corps imposes controversial and costly permit conditions without assuring that these conditions are, in fact, needed. The need for these conditions, which are frequently proposed by various Federal and State agencies, is not substantiated by site-specific data and research findings. Seasonal drilling, waste disposal, and pipeline height requirements are among those imposed without specific substantiation. (See pp. 27-33.)

RECOMMENDATIONS

To promote environmentally sound and cost-effective approaches to exploration and development activities in Alaska, GAO recommends the following:

--In its consideration of S. 1562 and other related proposals, the Congress should provide for three critical elements: coordination, prioritization, and a source of funding for research evaluating the impacts of energy development in the Arctic. Conceivably, a small portion of the revenues derived from Federal leasing of offshore and on-shore lands on the North Slope could be set aside in a special trust fund for that purpose. Appropriate congressional controls could be

maintained by requiring disclosure of planned expenditures as part of the budget process. (See p. 36.)

- The Secretary of the Interior should utilize existing research findings and site-specific data to the maximum extent possible and--after a source of further funding is worked out--direct and use additional site-specific research in the application of stipulations to future Alaskan energy projects. This should include using such data as a basis for determining whether the seasonal drilling restriction should be continued as a general stipulation for individual tracts.

In addition, to expedite the issuance of wetlands permits, the Secretary of the Army should

- grant extensions for public comments to the State of Alaska only when they are adequately justified and use research findings and site-specific data to the maximum extent possible in determining the need for proposed stipulations in future permits,
- require that Federal agencies support the need for proposed permit stipulations to the maximum extent possible with site-specific data and relevant research findings, and
- direct the Chief, Corps of Engineers, to have the Corps' Alaska district management periodically summarize the time required to issue public notices and enforce the 15-day time frame established by law. (See p. 36.)

AGENCY COMMENTS

Comments on a draft of this report were received from the Department of the Army (app. I) and the Department of the Interior (app. II).

The Assistant Secretary of the Army for Civil Works expressed general support for recommendations addressing permit delays and the need for permit stipulations to be justified, and indicated that improvements in the area can be accomplished through issuance of appropriate policy guidance to the Corps. More detailed comments are addressed in chapter 5.

Interior agrees that there is a need for more studies to determine long-term effects of energy

development in Alaska and for more site-specific research, but it takes exception to numerous portions of the report. The nature of these comments indicates a substantial misinterpretation of various report segments. Important areas of exception are summarized below.

- Interior states that the report ignores research pertinent to the issues discussed. In fact, the report considered ongoing research efforts, including those specified by Interior, in concluding that more effort is needed. GAO's conclusions are fortified by findings of scientific groups and by a foremost consultant in this field. Interior itself agrees that more research is needed.
- Interior disagrees that costly permit conditions are imposed without substantial evidence that they are necessary. Yet, GAO found no supporting justification for stipulations imposed in 45 of the 111 wetlands permits reviewed. The permit issuing agency, the Corps of Engineers, agrees such justification is needed.
- Interior states that the report fails to credit efforts to tailor stipulations to site-specific requirements and provide field staffs with authority to modify stipulations as appropriate. In fact, the report recognizes that Interior did this on the Kenai Refuge, and concludes that these elements will be desirable for future Alaskan energy projects.

Because of the length and nature of Interior's comments, a full text of those comments, annotated with GAO's responses, has been provided in app. II.



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ABBREVIATIONS

ACMP	Alaska Coastal Management Plan
AEIDC	Arctic Environmental Information and Data Center
ARL	Arctic Research Laboratory
BLM	Bureau of Land Management
Corps	United States Army Corps of Engineers
DOD	Department of Defense
EPA	Environmental Protection Agency
FWPCA	Federal Water Pollution Control Act
FWS	Fish and Wildlife Service
GAO	General Accounting Office

NARL National Arctic Research Laboratory
NOAA National Oceanic and Atmospheric Administration
NPRA National Petroleum Reserve--Alaska
NSF National Science Foundation
O&M Operating and Maintenance
OCS Outer Continental Shelf
USGS United States Geological Survey

CHAPTER 1

INTRODUCTION

ALASKA'S ENERGY IMPORTANCE

The United States Geological Survey (USGS) estimated in 1981 that Alaska's oil resources comprised between 11 and 37 percent of the Nation's total. There are plans to make this important resource available for exploration in a number of different federally owned areas. For instance:

- The first leasing of the National Petroleum Reserve in Alaska (NPRA) recently occurred. Additionally, the Bureau of Land Management (BLM) has proposed opening 12 areas to onshore leasing through 1985. Under this schedule, the first leases were issued in April 1982 in the Minchumina area.
- In accordance with Alaska National Interest Lands Conservation Act (Public Law 96-487) provisions, guidelines for the future exploration of the potentially energy-rich Arctic National Wildlife Refuge are being prepared.
- Alaska is surrounded by millions of acres of potentially productive Outer Continental Shelf (OCS) tracts, much of which is of current interest. The Department of the Interior's new proposed 5-year OCS lease schedule contains 16 lease sales in Alaska through 1986.

OBJECTIVES, SCOPE, AND METHODOLOGY

To help attain an adequate, effective balance between environmental protection and energy development, this report analyzes efforts by Federal agencies to minimize oil and gas-related negative environmental impact in Alaska. The report evaluates the success of Federal agencies in mitigating negative environmental impact from onshore oil and gas exploration and development in the Kenai National Wildlife Refuge which includes the only Federal lands in Alaska subjected to both energy exploration and significant production (see map on p. 3). The area was reputed to be a model for harmonizing environmental protection with industrial activity. We sought to determine if this is indeed the case, and, if so, to identify elements of success which can be used elsewhere on Alaska's Federal lands. Our evaluation included field observations conducted with Mr. David Hickok, Director of the University of Alaska's Arctic Environmental Information and Data Center; Mr. David Spencer, who was supervisor of Alaska's refuges during the peak of energy-related activity; and the Fish and Wildlife Service (FWS) representative who is presently responsible for managing such activity.

The report also discusses the need for additional research to evaluate environmental impacts arising from petroleum development in the Arctic. We examined the research issue because our previous report ("Trans-Alaska Oil Pipeline Operations: More

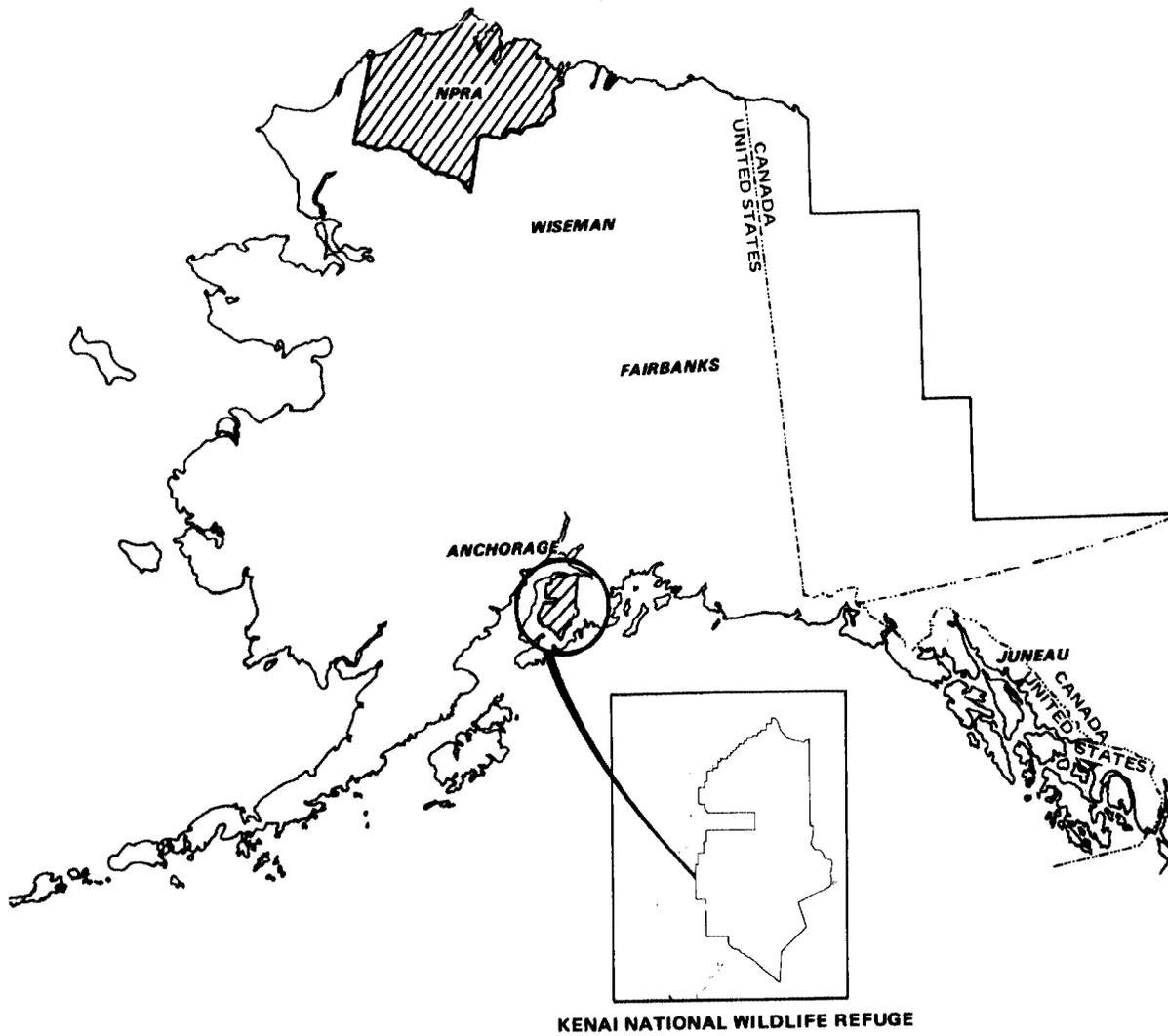
Federal Monitoring Needed," EMD-81-11, Jan. 6, 1981) had identified pipeline-related research gaps. We sought to determine whether this deficiency existed on a broader scale. Consequently, we evaluated the adequacy of research as it related to the National Petroleum Reserve in Alaska (see map on p. 3). This is the only Federal land on Alaska's productive and still promising North Slope which has been subject to significant exploratory activity. In addition, we examined the adequacy of research being conducted to determine the effectiveness of specific controversial impact mitigation measures which have been widely applied in the Alaskan Arctic. This portion of our analysis included field observations by our staff at Prudhoe Bay, in conjunction with U.S. Fish and Wildlife Service, Environmental Protection Agency (EPA), and State of Alaska officials.

Our analysis of the research issue drew upon reports and other information from governmental, academic, and private sector sources. We also reviewed pending legislation and the work of a multiagency study team which was examining the need for Arctic research. Our analysis was substantially aided by Mr. Hickok, utilizing the Arctic Environmental Information and Data Center's "Current Research Profile" and discussions with USGS, Bureau of Land Management (BLM), and U.S. Army Cold Regions Research and Engineering Laboratory personnel. His report regarding NPRA and the seasonal drilling window are included in app. III.

To determine if Canada's experience with Arctic petroleum exploration and development is relevant to Alaska, we interviewed Canadian industry and governmental officials and analyzed various documents. We were aided by Dr. Andrew Safir, an economist consultant who was extensively involved in the preparation of our report entitled "Petro-Canada: The National Oil Company as a Tool of Canadian Energy Policy" (EMD-82-5, Oct. 15, 1981). Our consultant's qualifications are in app. IV.

In addition, we analyzed the application of the U.S. Army Corps of Engineers' wetlands permitting process to energy exploration and development. This permitting process, arising from section 404 of the Federal Water Pollution Control Act as amended by the Clean Water Act (33 U.S.C. 1344), was chosen because of its widespread and growing applicability to Alaska's energy projects. The objective of this portion of our review was to determine how wetlands permitting affecting Alaskan energy projects could be improved. To meet this objective, we examined how long it takes the Corps of Engineers to issue wetlands permits for onshore oil and gas related projects. Our review included discussions with the Corps of Engineers, Alaska Department of Environmental Conservation, and Alaska Oil and Gas Association officials in Anchorage and officials from the State's Department of Environmental Conservation and Division of Policy Development and Planning in Juneau. We also attended the October 1981 meeting of the Alaska Wetlands Task Force. In addition, we reviewed permit files at the Corps' Alaska District Office in Anchorage and analyzed Federal and State wetlands studies. Finally, we interviewed headquarters' officials of the Office of Management and Budget and

ALASKA



quarters' officials of the Office of Management and Budget and Corps of Engineers in Washington, D.C., and reviewed the legislative history of key provisions of the Clean Water Act. Our review was performed in accordance with GAO's current "Standards for Audit of Governmental Organizations, Programs, Activities, and Functions."

Because complete Corps records were only available for the period February 1980 to September 1981, we limited our review to all of the onshore oil and gas-related permits issued during that period.

CHAPTER 2

ENERGY IMPACT MITIGATION ON

ALASKA'S FEDERAL LANDS--THE

KENAI NATIONAL WILDLIFE REFUGE

The U.S. Fish and Wildlife Service has successfully mitigated many negative environmental consequences of energy activity on the Kenai National Wildlife Refuge. The success of the Kenai Refuge mitigation effort--evidenced by our field observations and other evaluations--is generally attested to by others as well:

--FWS' Chief of Refuges advised that management of oil and gas activities on the Kenai Refuge is in some respects regarded as a model for harmonizing wildlife management and energy development. Local FWS officials at both Alaska regional and refuge levels concurred that impacts have been successfully mitigated.

--A study done by Dames and Moore ^{1/} for FWS entitled "Natural Resource Protection and Petroleum Development in Alaska" concluded, regarding the Kenai Refuge, that " * * * there is no question that the FWS was successful in its efforts to minimize the aesthetic and biological impacts of oil development there. While the wilderness character of the northern part of the Range was lost, there have been no apparent long-term, significant, or harmful direct impacts on the wildlife populations."

--During the height of petroleum activity in 1969, the U.S. Bureau of Commercial Fisheries, in an assessment entitled "Environmental Effects of Petroleum Development in the Cook Inlet Area," stated that the Kenai Refuge " * * * has even been able to establish a semi-wilderness canoe system in and adjacent to the Swanson River oil field. This system of regulations and constant surveillance has not completely eliminated pollution and other damage to the environment, but does provide a marked contrast to areas where oil operations are less intensively regulated."

The Kenai Refuge was the focus of our review because it is the only Federal land in Alaska which has been subject to significant onshore oil and gas exploration and production.

^{1/}A management consulting firm which specializes in environmental sciences.

PURPOSE AND USE OF THE
KENAI NATIONAL WILDLIFE REFUGE

The Kenai National Wildlife Refuge comprises about 2 million acres on Alaska's Kenai Peninsula. The refuge's environment is a forested, lake-dotted lowland lying south of the permafrost zone. Streams and lakes support fish populations of high commercial and recreational importance. Wildlife resources include moose, bear, trumpeter swans, and numerous other species. The refuge is accessible by road from Anchorage and, as such, is a prime recreational area. Several canoe trails are in and adjacent to oil and gas producing areas.

Oil was discovered on the Kenai Refuge in 1957. The bulk of exploration and development activity occurred from 1959 through the mid-1960s, with the early 1960s being the peak. Approximately 115 wells have been drilled. As of November 1981, 43 wells were producing in the refuge. Remaining refuge oil reserves are estimated at 20 million barrels. Cumulative production, as of November 1981, was over 194,500,000 barrels. Oil production is now about 9,550 barrels per day, and may cease by 1990. Projection of natural gas reserve, estimated at 265 billion cubic feet, may then begin.

The Refuge was originally called the Kenai National Moose Range, created by Executive Order 8979 on December 16, 1941, for the purpose of

"* * * protecting the natural breeding and feeding range of the giant Kenai moose on the Kenai Peninsula, Alaska, which in this area presents a unique wildlife feature and an unusual opportunity for the study in its natural environment of the practical management of a big game species * * *."

In December 1980, The Alaska National Interest Lands Conservation Act changed the name of the Range to the Kenai National Wildlife Refuge and expanded its purpose as follows:

- (i) To conserve fish and wildlife populations and habitats in their natural diversity including, but not limited to, moose, bears, mountain goats, Dall sheep, wolves and other furbearers, salmonoids and other fish, waterfowl and other migratory and nonmigratory birds.
- (ii) To fulfill the international treaty obligations of the United States with respect to fish and wildlife and their habitats.
- (iii) To ensure, to the maximum extent practicable and in a manner consistent with the purposes set forth in paragraph (i), water quality and necessary water quantity within the refuge.

- (iv) To provide in a manner consistent with subparagraphs (i) and (ii), opportunities for scientific research, interpretation, environmental education, and land management training.
- (v) To provide, in a manner compatible with these purposes, opportunities for fish and wildlife-oriented recreation.

MAJOR IMPACTS

FWS has successfully reduced negative energy impact on the Kenai Refuge, although some such impact is unavoidable. Through our field observations, it was apparent that exploration and production on the refuge have altered terrain and, in some cases, eliminated natural habitat. According to the former supervisor of Alaska's refuges who monitored energy development during its peak, energy-related impacts have had both positive and negative aspects. Positive impacts include

- improved recreational access, both on developed roads and seismic trails, provided at a minor cost to the Government; and
- additional food for moose from new growth on cleared areas, and easier access to that food because of seismic trail development.

The negative impacts were

- wildlife habitat lost to road, drill pad, storage area and other development, and a loss of natural characteristics in a portion of the refuge;
- displacement of species because of industrial activities' disturbance;
- human population growth leading to increased hunting, trapping, and fishing; and
- timber loss because of land development and disease caused by insect infestations.

Our field observations and evaluation focused upon seismic exploration, which had a pervasive impact on the refuge. See the map on page 8, which shows how widespread this exploration was.

Effects of seismic exploration on the Kenai Refuge

Seismic exploration is the key tool in delineating the location and potential size of an oil and gas reservoir. FWS must approve all seismic exploration permits and enforce all required stipulations for the Kenai Refuge. Our field observations showed that FWS refuge management has minimized impact from exploration, even though many miles of seismic trails have been constructed.



This map shows the location of the 1500 miles of Seismic lines on the Kenai National Wildlife Refuge. (FWS PHOTOGRAPH)

Initially, according to FWS officials, seismic exploration was unacceptably destructive, but FWS has developed stipulations suited for the Kenai Refuge which have lessened impact. Various seismic trail patterns have been used on the Kenai Refuge. The first trails were straight lines extending for miles. In the late 1950s or early 1960s, FWS personnel required offset lines (see p. 10). FWS considered this design to be of less visual impact than continuous straight lines.

In 1966, an oil company applied for a seismic permit to test a different type of seismic trail. The resulting wing pattern (see p. 11) was, according to FWS, much more destructive of habitat than either the straight or offset lines. It was not permitted again on the refuge.

FWS has adopted stipulations to lessen seismic exploration impact even more by requiring companies to use existing roads and seismic trails, rather than building new ones each year. In addition, seismic work is generally restricted to winter months when the ground is frozen and snow cover is adequate for vegetation and surface protection. But even in winter, the refuge manager has the flexibility, as provided by stipulation, to adapt practices to special conditions. For example, during several of the past years, early thaws have made the snow cover inadequate to protect the underlying vegetation. Consequently, the FWS refuge oil and gas manager halted seismic activity.

Destruction of vegetation and erosion is a major consequence of exploration. The following photographs, however, show the success of revegetation in minimizing these impacts (see pp. 12-13). The photographs show lands which were once outside refuge boundaries and which were explored using the general practices of the time. As shown, indiscriminate use of bulldozers created a considerable erosion problem. After FWS acquired the land in 1964, they obtained a grant from an oil company for restoration of the area.

A new, less destructive exploration method has been devised. Small explosive charges are detonated a short distance above the surface of the ground. Equipment and personnel are transported by helicopter. This method leaves little evidence of its use. The FWS oil and gas manager for the Kenai Refuge wrote in 1980 that "of several types of seismographic operations conducted on these (Kenai Refuge) lands during the past 23 years, this helicopter operation has proved by far the least damaging to surface resources."

Reasons for success and applicability to other areas

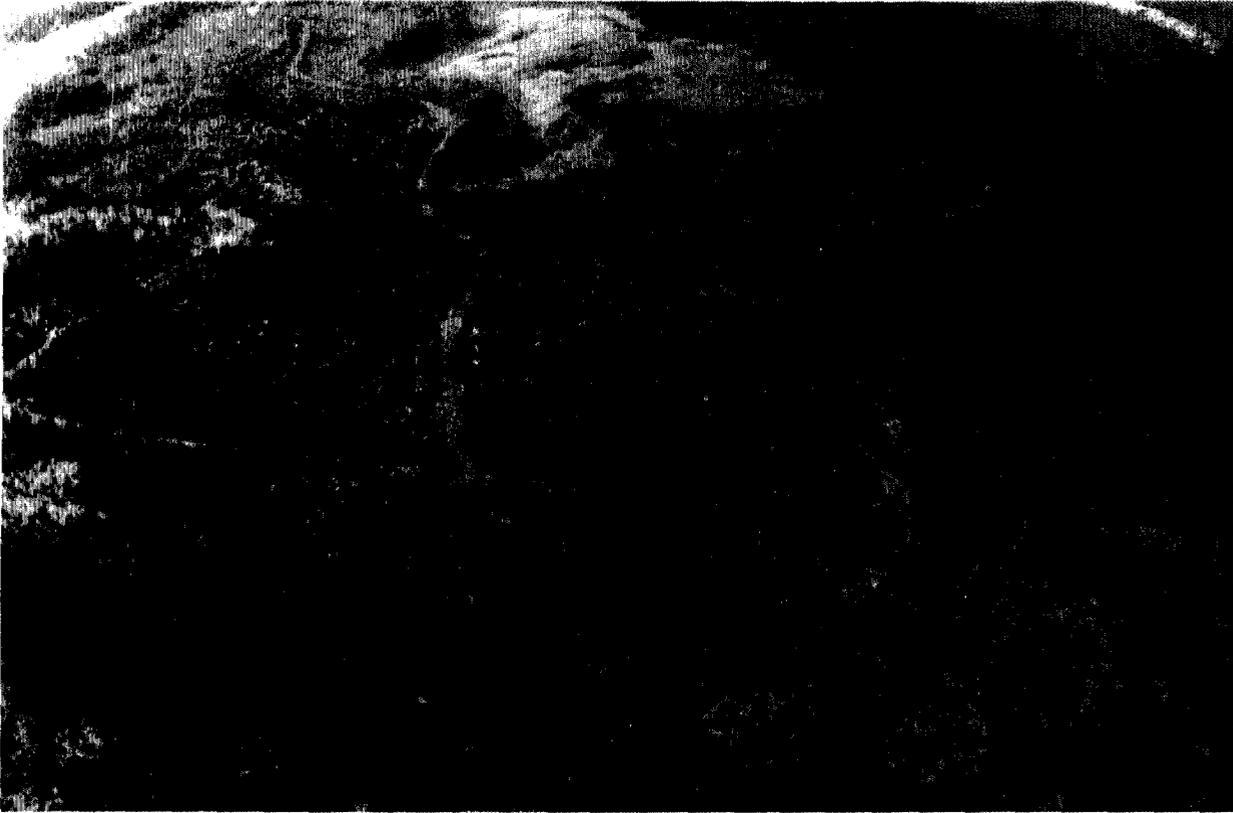
The successful FWS mitigation effort was characterized by the full use of managers with local knowledge and experience, leading to evolution of procedures patterned to the unique environmental characteristics of the refuge. The managers had the knowledge and administrative flexibility to adapt the general stipulation to

**Offset Seismic Lines
on Kenai Wildlife Refuge**



(GAO PHOTOGRAPH)

**Wing Pattern Seismic Lines on
Kenai National Wildlife Refuge**



(GAO PHOTO GRAPH)

Problem Created by Seismic Activity



Same Area Today After Reclamation

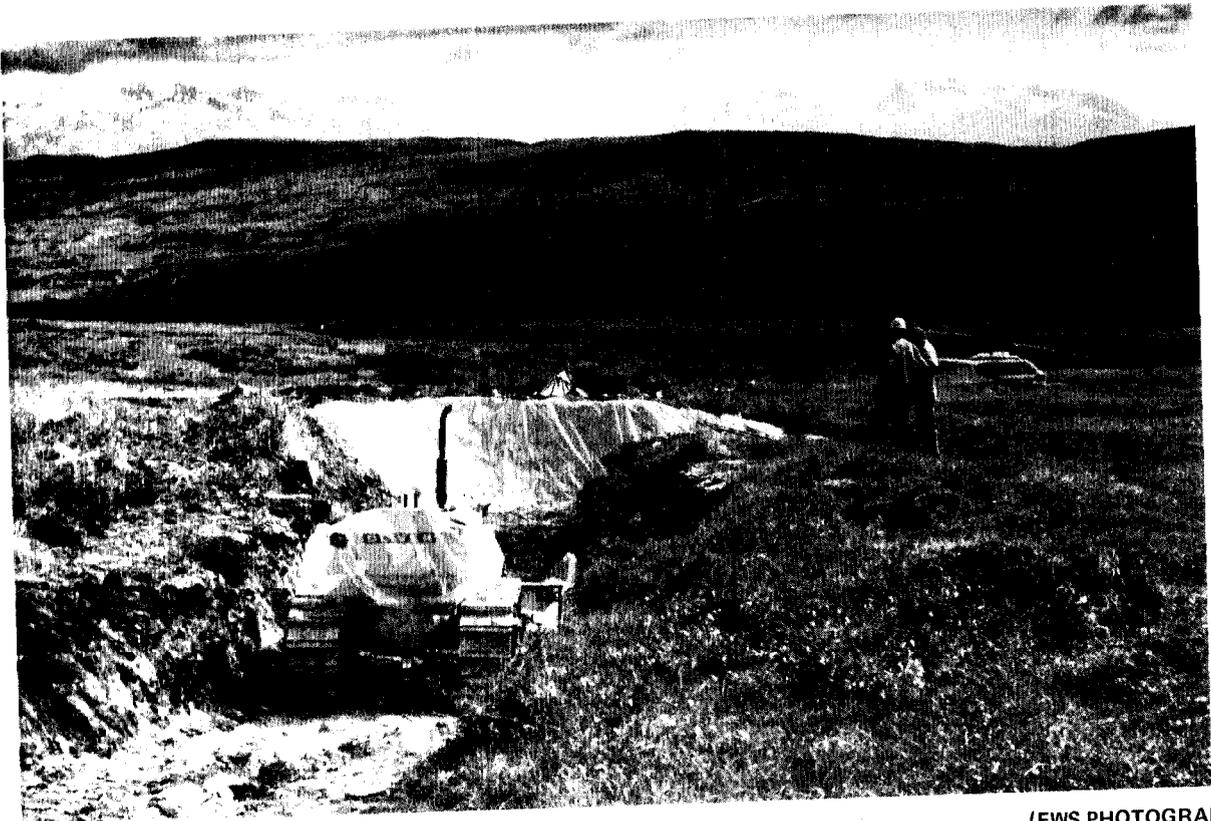


(PHOTOS COURTESY OF WALT & ELSA PEDERSON)

Erosion Caused by Seismic Activity



Restoration Work Underway, Funded by an Oil Company Grant



(FWS PHOTOGRAPH)

According to FWS personnel, past and present, who were directly involved, the streamlined non-bureaucratic nature of the Kenai Refuge management structure contributed to successful impact mitigation there. This included placing management and monitoring authority with experienced people, knowledgeable of local conditions. Perhaps the most outstanding lesson from the Kenai National Wildlife Refuge experience in oil and gas management centers on the simple aspect that FWS has employed field personnel over long periods who have had intimate knowledge of the territory they have managed. Their environmental acumen and concerns have been transferable to lease operators (whether in exploratory or production phases) on a direct one-to-one basis.

Additionally, according to Dames and Moore, the manager must have the ability to apply site-specific knowledge. Thus,

"* * * a very important aspect of the standard stipulations are the sections that authorize the Refuge Manager to impose additional conditions and instructions in an ad hoc manner that are appropriate to the proposed activity and the terrain affected by it."

These observations are also fortified by our report entitled "Trans-Alaska Oil Pipeline Operations: More Federal Monitoring Needed" (EMD-81-11, Jan. 6, 1981) in which we found that effective monitoring required experienced and knowledgeable staff with the ability to adapt stipulation requirements to site-specific fact situations.

CHAPTER 3

RESEARCH AND SITE-SPECIFIC KNOWLEDGE:

KEYS TO EFFECTIVE ARCTIC

ENVIRONMENTAL IMPACT MITIGATION

Arctic oil and gas operations must have procedures which are suitable for the harsh climate and protective of the fragile Arctic environment. At times, impact mitigation measures which are required are unprecedented, reflecting a response to operating in an environment about which little is known. We found that research designed to determine the effectiveness of these measures is not adequate.

These measures may be controversial and costly, as exemplified by the requirement that drilling be done only during the winter ("drilling window") and the requirement that drilling mud disposal pits be made leakproof. The seasonal drilling requirement was developed for offshore drilling but is now found onshore, and the requirement for leakproof disposal pits is now standard. Both measures have been applied generally in the U.S. Arctic, rather than as a consequence of site-specific knowledge supporting their need.

We also evaluated the adequacy of research as it pertained to impact mitigation on the National Petroleum Reserve in Alaska (NPR), the only Federal land north of the Arctic Circle which has been subject to significant energy activity. We found that research relating to the biological and societal impacts of energy development on NPR has not been adequate.

WINTER-ONLY DRILLING

Additional research is needed to evaluate the necessity of limiting drilling to winter months. This restriction has been imposed in a general, or "blanket," manner rather than on a case-by-case, site-specific basis.

The reasons for its imposition can be summarized as follows:

- Avoidance of widespread effects from oil spills which might occur during open water periods, or during breakup or freezeup.
- Allowance for time to drill a relief well prior to ice breakup should a well blowout occur.
- Minimization of disruptive effects of human activity on fish and wildlife resources (such as the bowhead whale) when they are in the critical reproduction period and are present in most abundance.
- Avoidance of long-lasting damage to the tundra environment which would result from transportation if the ground were not frozen (relevant to onshore drilling only).

The Department of the Interior advised that the wishes and concerns of the local population must be considered with regard to the the seasonal restriction. Interior stated that:

"This group represents a relatively powerful political entity which perceives the seasonal restriction as providing protection for maintenance of subsistence resources and life style. Members have publicly stated that they will immediately bring suit against the Secretary, as they have in the past, if the stipulation is removed or substantially modified. Precedent has already been set in that issuance of federal leases for the joint Beaufort sale area were delayed for six months over local concerns about the effect of the lease sale on Native cultural status."

The seasonal drilling restriction was generally applied by the Secretary of the Interior to all tracts included in the December 1979 Joint Federal/State Beaufort Sea lease sale. Exploratory well drilling was allowed during the 5 winter months only, from November 1 to March 31. The Federal stipulation was worded as follows:

"Exploratory drilling and testing, and other down-hole exploratory activities will be limited to the period November 1 through March 31, unless the Supervisor determines that continued operations are necessary to prevent a loss of well control or to ensure human safety. This stipulation will remain in effect for two years following issuance of the lease."

The State stipulation is similar in wording. Thus, the seasonal restriction is applicable to the entire lease sale area. However, it has only been applied on certain leased tracts occurring in Prudhoe Bay and east to Flaxman Island, a coastal distance of approximately 60 miles. Although developed for this offshore application, the restriction is now applied to onshore operations in State leases, Corps of Engineers' wetlands permits, and in Coastal Zone Management Act's consistency decisions. The Department of the Interior and the State of Alaska are examining the need for continuing the seasonal drilling restriction.

Need for the seasonal drilling restriction is disputed

The FWS, the National Marine Fisheries Service, and the Alaska Department of Fish and Game maintain that seasonal drilling is needed. Citing the large Mexican oil spill in 1979 off the Yucatan Peninsula, the agencies point out that blowouts can and do occur and that present technology is inadequate to prevent them. The restriction is needed, they feel, to provide protection to Beaufort Sea animals in the open water season when biological activity is at

a maximum. The restriction of drilling to winter periods provides protection by confining operations to periods of solid ice cover.

In response to the fears that exploration is the most risk-prone phase and that it can lead to a major oil spill, oil company representatives responded that:

"Because of the uncertainties involved in exploratory drilling, extreme care and caution are utilized. The fact that exploratory wells cost four to five times more than development wells indicates the degree of concern. Further, it takes four to five times longer to drill an exploratory well, another indication of the extreme precautions taken. Hydrocarbon accumulations may be encountered several times before total depth has been reached. In the entire history of U.S. OCS drilling, there has never yet been an exploratory oil well blowout."

The State of Alaska's Oil and Gas Conservation Commission states that the amount of oil spilled per barrel produced is extremely small. Further, the Commission concluded that:

"The current U.S. statistics, both in the Gulf of Mexico OCS and in Alaska, demonstrate conclusively that improved technology, industry efforts, and government regulations have worked to drastically reduce oil spills from all sources and to essentially eliminate oil spillage from blowouts within U.S. jurisdiction."

Industry maintains that past performance shows the seasonal drilling restriction to be unjustified and unrealistic. Summer drilling, both USGS and industry maintain, is in fact safer than winter drilling. A USGS position paper raised questions about the restriction. The agency stated that:

- Continuous drilling is preferable and safer than discontinuous (seasonal) drilling.
- The risk of an oil spill from an exploratory well is extremely small.
- The cutoff date, which is based on the time needed for a relief well, would not in fact allow adequate time for the relief well to be drilled.
- Laws, regulations, and permit procedures provide adequate protection.

A USGS official states that Prudhoe Bay proves that drilling all year is safe. He maintains that the decision to impose the window should be on a case-by-case basis, rather than in a "blanket" manner as was done in the Beaufort Sea lease sale.

The Canadian experience

The Canadian approach to the regulation of Arctic energy exploration and development could provide guidance for what to do in the Alaskan Arctic. The Canadian government is a major participant in Canadian Arctic operations, which include onshore, artificial islands, and drill ship activity. Regulation of this activity incorporates less prohibitive lease stipulations and substantially more flexible permit regulations than in the United States--while addressing the same concerns. Principal regulatory tools include exploration agreements negotiated between the operator and the regulating agency which tailor regulation to the specific activity being allowed. In general, companies negotiate a seasonal drilling program authority with the appropriate governmental agency before commencing operations. This agreement sets forth the general stipulations which must be adhered to during drilling operations. These cannot be changed in any fundamental way until the authority is renegotiated between the parties the following drilling season. They are flexible enough, however, to be modified by onsite governmental personnel should circumstances warrant.

Canada's treatment of the winter drilling restriction, or drilling window, is indicative of this case-by-case flexibility.

--The MacKenzie Delta drilling season dates are from November 1 to April 1, but both starting and ending dates are modified with some frequency.

--In the Arctic Islands, actual drilling operations commence as soon as ice platforms are in place, and continue until ice conditions become too unstable to safely support exploration. This usually occurs during June, and although a specific date is included in the governmentally approved program, it can be modified on a case-by-case basis.

According to our consultant, an expert in Arctic environmental matters, there are practical reasons for considering each case on its own. All across the Arctic from the Bering Sea to the Canadian Beaufort Sea, there is a wide variation in the average sea ice, shorefast ice, and river delta ice breakup and freezeup dates. Similarly, there are differences in the mean dates of insect emergence, fish and wildlife productive cycles, and animal migrations. Even on the Beaufort Sea coast, differences exist in these dates between the Prudhoe Bay area and either the Colville River delta to the west or the MacKenzie River delta on the east. Neither the advocates of the "drilling window" concept nor industry opponents will be served by adopting "drilling window" dates derived for one geographic area and applying them to another. In every case site-specific information should be applied.

The seasonal drilling restriction is expensive in time and money

Industry estimates that additional costs of limiting the drilling season to the 5-month winter period range from \$1.6 to \$25 million per well. Costs accumulate because new ice roads must be built, drilling rigs demobilized and reactivated, and new crews hired. For 1 year, a company estimates these costs to be \$75,000 per day, or \$16 million for the 214 days equipment stands idle.

The State of Alaska may bear indirectly some of the additional costs when the well is on State land, and State royalties are calculated on a net profit basis. This is because increases in costs decrease net profit, and thus, State royalties would be reduced. In addition, the Director of the State's Division of Minerals and Energy Management (the organization responsible for issuing leases and managing oil and gas operations on State lands) advised that the existence of the seasonal drilling restriction on a leasehold reduced the value of the lease. This fact, he stated, is reflected in lower industry bids. Industry officials advised that while this element is not specifically factored into a bid, it could well have a minimizing effect.

The time restriction is actually more limiting than is at first apparent. Although drilling is allowed for 5 months (November through March), it is actually possible for less than 3 months because of the preparation activities required, including rebuilding adequate ice roads to the drill site. Oil companies say that they cannot drill and test a well in that short a time, so they have to plan to reopen the well the following year. Thus, it takes 2 years to do work which previously took only 1 year.

The status of research related to the seasonal drilling restriction

Our consultant advised, after his review of research related to this restriction, that biologists cannot substantiate their position with qualitative studies and industry cannot guarantee that its activities will not result in a spill. There is no current research being conducted to evaluate the effectiveness and necessity for the "drilling window" concept either on or offshore in the Beaufort Sea coastal region. While there are a few current ad hoc studies that may be applicable to such evaluation, they have not been brought together in a systematic, problem-solving way.

For example, Interior and the National Oceanic and Atmospheric Administration have done some research addressing the effect of industry activity on the bowhead whale. Interior stated that:

"This research is in its fourth year and has provided information on the distribution and abundance of bowhead whales in the spring, summer and fall; timing of spring and fall migrations; and spring

and fall migratory routes. * * * Specifically, the research indicates that the westward bowhead migration begins in September and generally is over by early November. In addition, a portion of the migration takes place near the Federal/State lease area. The spring migration takes place far offshore after the bowhead whales have passed Pt. Barrow. Three years of aerial surveys in and near the Federal/State lease area in the summer have indicated that bowhead whales do not inhabit this region in the summer."

At present, according to our consultant, both sides can only argue incompletely because of inadequate knowledge to conclusively support either side of the seasonal restriction issue. Any decisions on the future application of the "drilling window" concept can be refined by further research, particularly if comprehensively designed and if based upon a foundation of current existing knowledge. Such research may have to be continued to resolve the many facets of the issue in a scientifically acceptable manner. Thus, the type of studies most useful to practical decisions need to be carefully ascertained.

ARCTIC DRILLING WASTE DISPOSAL

On the Alaskan Arctic, no spreading or dumping of drilling wastes (mud) on land is permitted. In order to reduce the possibility of pollution from harmful materials in the waste, the Corps of Engineers, FWS, and the Alaska Department of Environmental Conservation require the use of impermeable pits in all oil and gas construction in the Arctic. The need for impermeable pits is an important issue because of the general requirement for their use. BLM and the USGS believe that this requirement should not be universal. Industry maintains it increases costs and is not necessary in every case.

The Corps of Engineers' general permits issued in October 1981 require that "* * * pits shall be rendered impermeable by a design of the applicant's choice. Permafrost alone is not a sufficient barrier." These permits are designed to have general applicability to North Slope activity, including NPRA.

USGS believes that imposition of this stipulation by the Corps is a duplication and usurpation of its supervisory powers over oil and gas operations as granted by Federal law. In commenting on this provision, USGS' Onshore District Minerals Supervisor for Alaska advised that pits had not been artificially lined on the Kenai Refuge nor on NPRA, and there is no necessity for it now. In commenting on the necessity for the provision on NPRA, the Alaska Oil and Gas Association and several companies questioned the impermeability requirement. The Association said:

"Practical experience on the North Slope has shown that it is unnecessary to line reserve mud pits because muds are not toxic and permafrost provides an effective impermeable barrier * * *. This

requirement should only be included for permitting of activities on a site by site basis."

However, the District Engineer for the Corps of Engineers' Alaska District advised that the companies have not supported their arguments against the impermeability requirement with research findings.

Interior commented that FWS:

"* * * has requested that all flare pits and reserve pits be rendered impermeable by a design of the applicant's choice. ARCO's engineering data for the buried-in-the-road pipeline concept first proposed for the Kuparuk oilfield showed that roads and other pads thawed by mid-August, thus refuting industry's claim that pit walls constructed of gravel placed on the tundra were impermeable to oils and other hydrocarbons in the pits. There have been several recent failures of production reserve pits in Prudhoe Bay pads, most significantly at Sohio Pads C and E. Sohio is now engaged in a voluntary retrofit program to render reserve pits impermeable. Production reserve pits often contain toxic chemicals used for well cleaning and testing. In 1976 the reserve pit at the East Teshckpuk exploratory well in NPRA gave way and discharged into the lake because the berm was constructed of ice rich material."

Further, Interior stated that FWS:

"* * * considers these stipulations on a site-specific basis. Earlier requests to require Exxon to line reserve pits at Pt. Thomson wells were withdrawn after the applicant explained the reserve pit would be excavated below ground and the top level of the reserve pit muds could be kept below the thaw zone by discharging excess muds down the well annulus. The Service does not request stipulations to render emergency relief pits impermeable because of the small likelihood they will be used for discharge, provided any hydrocarbon discharges are removed within 48-72 hours during the summer and as soon as practicable in winter."

According to some sources, the pits themselves may not always be a necessity. BLM and USGS representatives stated that spreading mud on the ground may sometimes be more acceptable than using mud pits. They said that pits may be needed in some instances, but point to the NPRA experience from the 1940s and later to show that mud spreading is not of permanent significant harm. However, as discussed in the following section, the impacts of petroleum exploration on the NPRA have not been adequately evaluated.

However, Interior has studied the on-ice waste disposal problem. With regard to offshore waste disposal, Interior's actions provide an example of how results from site-specific research can be utilized to establish stipulations. Interior stated that:

"All resource agencies agreed to an experimental on-ice disposal of drilling muds and cutting which were not oil contaminated at Sohio Delta 7 and 8 artificial gravel island wells during the 1980-81 drilling season. Monitoring by the applicant's consultants indicates excellent dispersal at these locations. Subsequent permit reviews have not requested backhaul where ocean currents would satisfactorily remove muds away from sensitive areas such as the kelp beds of the Beaufort Sea boulder patches."

THE NATIONAL PETROLEUM RESERVE
IN ALASKA: RESEARCH GAPS EXIST

NPRA, on Alaska's North Slope, comprises about 23.7 million acres--an area the size of Indiana. The neighboring Prudhoe Bay oil field is the largest ever discovered in North America. Unlike the Kenai Refuge, which is largely permafrost free, NPRA is primarily tundra underlain by permafrost. It is rich in wildlife resources, some of which provide food and other necessities to local residents. The first lease sale of NPRA to private industry was held January 27, 1982. It is the only Federal land in Arctic Alaska which has been subject to substantial oil and gas exploration.

The USGS and the Army Cold Regions Research and Engineering Laboratory are primary sponsors of NPRA-related research. Our evaluation found, with the aid of an expert consultant, that more research is necessary to evaluate energy-related impacts on the NPRA. In our analysis, we found that present research efforts are inadequate to evaluate energy-related impacts on NPRA. In our analyses, environmental impacts were categorized as

- physical impacts, including such incidents as soil disturbance and site degradation;
- biological impacts, including stresses upon fish and wildlife populations; and
- societal impacts, including the curtailment or disruption of native subsistence hunting and fishing, or the limiting of recreational uses.

We concluded that the bulk of NPRA research is related to the physical category of environmental impact. The major concern has been on securing knowledge of the geologic resources and geophysical setting within the reserve, with surficial impacts upon soils, permafrost and vegetation, the chemical and hydrologic analysis of aquatic systems, and technologic and engineering investigations.

While physical impact research is emphasized, research regarding biological and societal impacts is not adequate. For example, examination of fish, wildlife, and societal and economic disruptions from changes in subsistence and other life patterns is suffering from lack of long-term research design, planning, and fiscal commitment. In addition, there is no long-range research planning on the structure and dynamics of Western Arctic caribou populations, fisheries, or native subsistence patterns.

The Department of the Interior in its comments on our draft report agreed that physical research has been stressed on the NPRA and that research related to biological and social impacts is inadequate; however, they also believe that basic geologic and hydrologic research are needed.

According to BLM's September 1981 environmental assessment of the NPRA Federal oil and gas lease sale, existing research is not adequate for tract-specific management. The assessment concludes that additional tract-specific investigations designed to fill data gaps are necessary, and lists studies which resource specialists have proposed. Studies were recommended for all categories of impact--physical, biological, and societal--as follows:

- Endangered species, caribou, moose, and fisheries.
- Vegetation soils, reclamation, habitat classification.
- Gravel inventory.
- Recreation.

The State of Alaska recommended that subsistence studies be added to this list. In addition, Dames and Moore found that there had been inadequate research to judge the effectiveness of impact mitigation on NPRA.

"Evaluation of impact mitigation in NPRA depends largely on incomplete, indirect, and circumstantial evidence. Despite recent interest in biological studies, information on actual impacts to fish and wildlife resources is still very scarce. This is not only because the necessary studies lack priority and funding, though this certainly is a critical reason. It is also that impact evaluation studies can be very difficult to perform convincingly and well."

We found, in our Trans-Alaska Oil Pipeline report (EMD-81-11, Jan. 6, 1981) that additional research is necessary to determine the long-term environmental impact of pipeline activity. We recommended a mechanism for identifying and prioritizing necessary pipeline-related research. Our current analysis identifies a similar gap, and it demonstrates the need to evaluate the effectiveness of specific mitigating techniques which have been utilized in Alaska. Several measures which could address these problems have been proposed.

PROPOSALS TO STIMULATE
ARCTIC RESEARCH

A study team composed of representatives from the Departments of Interior, Defense, and Energy recently addressed the need for Arctic science policy and research. Their report, entitled "A Study of United States Arctic Research Policy and the Possible Roles of the Naval Arctic Research Laboratory" was released in March 1982. The study, mandated by section 1007 of the Alaska National Interest Lands Conservation Act (Public Law 96-487), identifies special circumstances which exist in the Arctic that justify a highly coordinated research program. These circumstances include:

- * * *poor knowledge of the location, quantity, and quality of Arctic non-renewable resources because of their remoteness, the adverse climate, and a previous lack of economic incentive.
- The high susceptibility of the Arctic environment to disturbances associated with exploration, development, and delivery of natural resources. The danger of disturbance is especially great because the subsistence lifestyle of Native people depends on the maintenance of poorly understood natural systems, which are both sensitive to change and slow to recover.
- The limited familiarity of U.S. scientists, engineers, and resource development managers with Arctic climate and the associated physical and biological systems.
- The great expense of conducting research and other operations in the Arctic, due to both the distances involved as well as the climate. As in Antarctica, the high costs per unit of science places Arctic research at a disadvantage in the national framework of science support.

The study team concluded that research to collect scientific information is important to achieve effectiveness in almost any large resource development venture in the U.S. Arctic, and that there is a need to carefully prioritize and closely coordinate Arctic research projects.

The study group recommends three options which address the need for an Arctic science policy and a body for coordinating research. One option provides for the development and implementation of an explicit Arctic research policy and a commission to manage the Arctic research program. The commission would coordinate Federal Arctic research, and would secure and disburse Federal funds for research grants to non-Federal organizations and in support of facilities and logistics for Arctic research. Funding for federally conducted research would go directly from the Congress to the individual Federal agencies.

In a recently completed report entitled "A United States Commitment to Arctic Research" by the Polar Research Board, National Academy of Science, three organizational alternatives for coordinating Arctic research were presented for consideration. The Board recommended the establishment of a small, independent Federal commission as the option with greatest potential.

The Arctic research issue is also being addressed in another context. A bill (S. 1562) pending in the Congress seeks to provide a comprehensive research policy to deal with national needs and objectives in the Arctic. Our consultant has been involved in the development and congressional consideration of this bill. The bill would

- direct the administration of a coordinated Arctic research policy in which important basic and applied research issues will be addressed in a timely fashion;
- provide an information system through which the results of non-proprietary Arctic research carried out by Federal and State governments, universities, and the private sector are made accessible to the public in order to prevent inadvertant duplication of research;
- accelerate, where appropriate, the pace of basic and applied Arctic research so that needed resource development can take place on a timely basis and in accordance with national needs;
- establish the means for providing the financial support necessary to conduct needed applied and basic research; and
- establish an institutional framework to assure the achievement of these objectives.

In the accomplishment of these objectives, the bill would establish an Arctic Research Council, composed of the Secretaries of Interior, Defense, and Commerce. Among the Council's functions would be the identification, prioritization, and funding of Arctic research. An Arctic Research Fund would be established which would receive 1 percent of all revenues received by the Federal Government from the disposition by sale or lease of any interest in the OCS located off the coast of the North Slope of Alaska and in lands on the North Slope of Alaska. No more than \$25 million is to be paid into the Arctic Research Fund in any 1 year and the total amount of money in the fund at any one time is not to exceed \$50 million.

Much of the research envisioned by the bill--e.g., that which is defense-related--goes beyond the scope of this report. The bill, however, does appear to have several provisions--including a source of additional funding--which could mandate the type of energy-impact related research which we believe is needed in the Arctic as a basis for assuring that cost-effective mitigation techniques are included as a part of future development projects.

Appropriate congressional oversight and control could be maintained by requiring disclosure of planned expenditures as part of the budget process.

CHAPTER 4

MORE EFFECTIVE WETLANDS PERMITS

WILL FACILITATE ALASKAN OIL AND GAS

EXPLORATION AND DEVELOPMENT

Delayed issuance of U.S. Army Corps of Engineers (Corps) wetlands permits hampers Alaskan oil and gas projects. Automatic extensions to the public comment period ^{1/} and late issuance of public notices contribute significantly to this delay. In addition, the Corps imposes permit stipulations without requiring documentation and support from the agencies which propose them. The necessity for some of these stipulations is questionable.

Permit delays and extraneous stipulations increase costs of oil and gas exploration and development. The Corps and the Alaska Wetlands Task Force have tried to expedite permit processing and reduce regulatory paperwork and duplication. However, more needs to be done to reduce permitting delays and to ensure that permits contain only justifiable stipulations.

Wetlands are an important national resource, providing habitat for fish, animals, and birds. Estimates of the amount of Alaska wetlands range from 131 to 300 million acres. Wetlands may serve as flood control systems, storm buffers, pollution filters, and may lessen erosion along coastal lands. Because of these many potential uses, proposed activities affecting wetland areas are scrutinized by a number of Federal and State agencies (see app. V). In Alaska, wetlands comprise extensive areas on the energy-rich North Slope. Consequently, Corps' permitting has become of prime importance in Alaskan energy development.

Section 404 of the Federal Water Pollution Control Act of 1972 (FWPCA) designated the Secretary of the Army, acting through the Corps, to permit discharge of dredge and fill material into United States waters, including wetlands. The 1977 Clean Water Act amendments to FWPCA establish certain permit processing time limits, provide for general permits, provide for State administration of wetland programs with Federal approval, and call for agreements between the Corps and other Federal agencies.

These agreements were to minimize duplication, paperwork, and delays. In March 1980, the Secretary of the Army signed such agreements with the Administrator of the EPA and the Secretaries of Commerce, the Interior, Agriculture, and Transportation. One objective of the agreements was to help assure that the permit processing time

^{1/}This period henceforth will be referred to as "agency comment period," since our focus is on agency comments.

requirement is met. The various processing goals are summarized below.

Table 1

Wetland Permit Processing Goals

<u>Process</u>	<u>Goal</u>	<u>Type</u>
From receipt of application to permit issuance	3-1/2 months (105 days)	Statutory, memorandum of agreement
From receipt of application to public notice	15 days	Statutory, regulatory
From public notice to receipt of agency comments	a/ 1 month (30 days)	Regulatory

a/Under unusual circumstances, extensions may be granted up to 75 days.

The flow chart on page 29 depicts these goals and related permit processing steps.

CORPS WETLANDS PERMIT DELAYS

In order to evaluate the Corps' permitting process for onshore oil and gas activity, we analyzed all wetlands permits issued for such activity in Alaska during the period February 1980 through September 1981. The total number of permits issued in Alaska in this category was 167. Comparing the time frame to issue these permits with the Clean Water Act goal of 105 days, we found that:

--150 days was the average processing time for the 167 permits we reviewed and

--40 permits were issued on time, but the remaining 127 were late for varying amounts of time, as shown below:

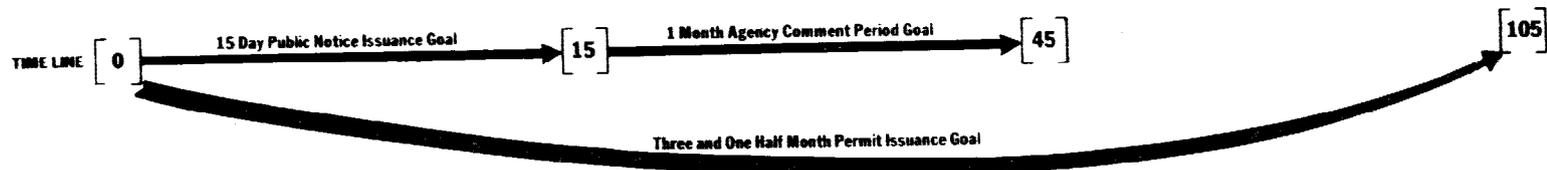
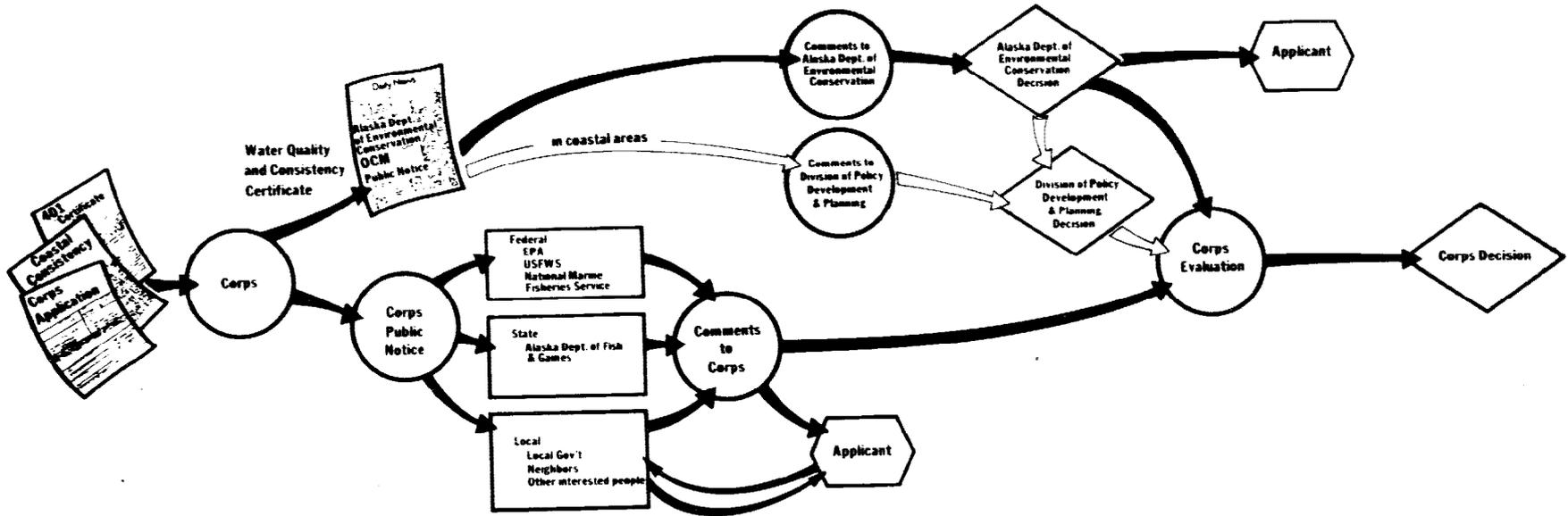
Table 2

Permits Categorized by Number of Days Late

	<u>Days late</u>				
	<u>1-30</u>	<u>31-60</u>	<u>61-90</u>	<u>91-120</u>	<u>Over 120</u>
Number of permits	38	38	28	12	11

Our analysis showed that (1) delays by the Corps in issuing public notices and (2) virtually automatic extensions to agency comment periods accounted for significant portions of the delays experienced.

THE PERMIT PROCESS FOR WETLANDS



SOURCE: Alaska Department of Environmental Conservation as Modified by GAO.

Delayed public notices

After receiving a permit application, the Corps is required to issue a public notice containing information about the location, nature, and scope of the proposed wetlands activity and to provide copies of such notice to interested parties. The Corps' Alaska District has not, on the average, issued public notices within the 15-day period specified by law and Corps regulations. For fiscal year 1981, the Alaska District averaged 21 days to issue public notices after complete applications had been received, and 50 of the 75 permits issued were issued late. Between February and September 1980, the average time to issue public notices was 28 days, and 61 of the 85 were issued late. The Alaska District Chief of the Regulatory Functions Branch for the Corps said processing backlogs cause the greatest delay in issuing public notices, once applications have been completed.

In June 1980, we reported that three Corps' districts (not including Alaska) were not meeting the 15-day public notice requirement and recommended that districts periodically summarize the time required to issue such notices and enforce the 15-day time frame established by law. ^{1/} Our work in Alaska showed that the Corps' Alaska District also has been and continues to be delinquent in meeting the 15-day time frame and still is not summarizing statistics showing the time required to issue public notices.

Extended agency comment periods

The Corps of Engineers has routinely and repeatedly granted extensions of time for agency comments on wetlands permit applications. However, the regulations provide that extensions of up to 75 days can be granted "if unusual circumstances warrant." Despite this, 51 percent of the 167 permits reviewed involved extensions to agency comment periods which the Corps granted without requiring specific justification. Consequently, the 30-day comment period specified in Corps regulations is frequently exceeded, and permit issuance delayed.

Agencies' requests did not support or justify the need for extensions. The State of Alaska's Division of Policy Development and Planning received 80 of these extensions, resulting in an average delay of 41 days. Two Federal agencies, the FWS and EPA, were granted the remaining 11 extensions. Extensions granted to all agencies delayed issuance of the permits by an average of 42 days, ranging from 8 to 135 days. These findings are summarized in the following table.

^{1/}"Managerial Changes Needed to Speed Up Processing Permits For Dredging Projects," CED-80-71, June 9, 1980.

Table 3

Length of Extensions
to 30-Day Agency Comment Period

	(Days) <u>Average extension</u>	<u>Range (days)</u>	<u>Number of extensions</u>
State of Alaska Division of Policy Development and Planning	41	15 - 135	80
U.S. Fish and Wildlife Service	49	8 - 90	9
Environmental Protection Agency	<u>60</u>	<u>60</u> - <u>60*</u>	<u>2</u>
Total	<u>42</u>	<u>8</u> - <u>135</u>	<u>91</u>

*EPA received two extensions, each for 60 days.

Extended agency comment periods contributed significantly to delay in issuing Alaska wetlands permits affecting onshore oil and gas-related construction projects. Our June 1980 report also found that extensions to Federal agency comment periods caused permit delays in other States. In Alaska, however, most of the extensions granted by the Corps are to State, rather than Federal, agencies. The State agencies are not required to justify the need for extra time. Federal agencies are so required, by memorandums of agreement with the Corps.

The average processing time (150) days extended the processing time goal (105) by 45 days. Comparing the 42-day average length of extensions to this 45-day delay indicates that comment period extensions account for a significant portion of overall delay. Corps of Engineers' officials stated that this was indeed the case and that extensions granted to State agencies were the biggest problem.

Alaska Corps of Engineers' officials advised that extensions are automatically granted to the State because the State has lengthy periods of time, by law and regulation, to do coastal zone management consistency determinations and water quality certifications. Both of these State actions are required for a wetlands permit to become effective. The District Engineer for Alaska advised that he was considering holding the State to the 30-day comment period and issuing the permit on time. However, no action could be taken under the wetlands permit until the State completes its certifications.

The March 1980 Corps' memorandums of agreement with Federal agencies require documentation for extensions to the comment period. This requirement seems to have discouraged Federal agencies from requesting automatic extensions. For example, only one undocumented

extension was requested by a Federal agency for any permit applied for after March 1980. In contrast, the FWS and EPA requested 10 automatic extensions for permits applied for prior to issuance of the memorandums of agreement. Additionally, these agreements appear to have improved timeliness. For example, the Corps averaged 185 days to issue permits applied for prior to March 1980. For permits applied for after March 1980, the Corps' average issuance time was 133 days. Thus, the agreements may have contributed to a reduction in average issuance time of 52 days.

The Corps, however, lacks a memorandum of agreement with the State of Alaska--the major recipient of these extensions--which would provide that the need for comment period extensions be documented.

Delays increase costs

Delays in issuing wetlands permits in Alaska caused by extensions to reviewing agencies' comment periods increase energy exploration costs. For example, on April 3, 1980, an oil company applied for a wetlands permit to construct a drilling mud pit on the east dock of Prudhoe Bay. In reviewing this application, the State's Division of Policy Development and Planning requested and received from the Corps seven extensions totaling 135 days. As a result of these extensions, the Corps issued the permit in 225 days, or 114 percent longer than the goal included in the Clean Water Act. The oil company claimed that permit delays negated planned summer construction and resulted in more costly, inefficient, and complicated winter construction. According to the Alaska Oil and Gas Association's Manager for Exploration and Production Affairs, project costs more than doubled.

Although no summary cost figures are available for Alaska, the American Petroleum Institute reported in March 1980 that 55 Corps permit delays in Southern Louisiana cost the industry \$19 million. The report estimates lost or deferred production totaling 428,000 barrels of oil and 14.9 billion cubic feet of gas because of these permit delays.

GENERAL PERMITS

In addition to granting individual wetlands permits, the Corps grants general and nationwide permits which cover generally minor and non-controversial projects having no significant environmental impact. Projects authorized by general and nationwide permits are usually not subject to lengthy processing because such permits authorize specific categories of activities in advance. Thus, if an applicant's dredging or filling needs fall within these previously specified categories, little or no paperwork or delay will likely occur.

The Corps has used general permits in Alaska to reduce delays. In March 1979, the Corps issued general permits for certain oil company construction activities on the North Slope. The permits

covered the expansion of existing pads and the extension of existing roads on wet tundra. We reviewed all of the authorization letters issued under the 1979 general permits and found that processing times averaged 63 days. This compares quite favorably to the Corps' fiscal year 1981 average processing time of 152 days for regular wetlands permits.

UNSUPPORTED PERMIT STIPULATIONS

Overall, we found that 66 of the 111 permits which contained stipulations had some site-specific support for these stipulations provided by the proposing agency, including Fish and Wildlife Service. However, the remaining 45 lacked site-specific support for the stipulations which were included.

The Corps does not require that agencies establish the need for proposed stipulations with site-specific data and research findings. The need for some of these stipulations, which have been included without such support, is controversial. For example, some Corps permits prohibited drilling except during winter months, required impermeable waste disposal pits, and established a minimum pipeline height for animal crossings. As discussed in chapter 3, seasonal drilling restrictions and impermeable waste pits are costly, and their effectiveness has not been established. The questions surrounding the necessity for the expensive elevated pipeline animal crossings were discussed in our January 1981 report entitled: "Trans-Alaska Oil Pipeline Operations: More Federal Monitoring Needed."

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS AND AGENCY COMMENTS

THE NEED FOR ENVIRONMENTAL IMPACT RESEARCH AND SITE-SPECIFIC APPLICATION OF STIPULATIONS TO ENERGY PROJECTS

Alaska's Federal lands are important to the Nation's energy future. Yet, the wildlife, scenic, and recreational resources of these lands also constitute assets of unique national value. Consequently, environmentally sound energy development is in the national interest. Because of the frontier and experimental nature of operating in Alaska, unique and costly protection measures have been required to protect these values. However, the effectiveness of these measures has not been ascertained.

Research is needed to determine what impact energy development has already had on Alaskan lands. Lacking such research, it is not possible to ascertain whether measures taken to reduce impact have been effective or are necessary. Research results could be used to substantiate or modify protective measures. In some cases, stipulations controlling development might prove to be unnecessarily restrictive, and consequently could be relaxed. In other instances, new or additional measures might be in order. Research findings would allow placement of environmental protection controls suitable to the unique characteristics of the lands to which they are applied. Such "site-specific" knowledge would help minimize the use of universal or "blanket" controls which may be unnecessary or unsuited for some of the land to which they are applied.

For example, both the seasonal drilling restriction and requirements regarding drilling waste disposal have been applied widely; the former has been applied by the Secretary of the Interior in Beaufort Sea lease stipulations which covered a broad area and the latter by the Corps of Engineers in general permits applicable to a wide range of developmental activity. Since these requirements can make energy exploration more costly and less timely, they should be applied judiciously. Gathering of site-specific data to allow application on a case-by-case basis, followed by impact-related research to further refine the requirements, is needed.

Fish and Wildlife Service refuge managers' use of site-specific knowledge to minimize harmful developmental impact was exemplified on the Kenai National Wildlife Refuge. This is the only Federal land in Alaska which has been subject to significant oil and gas exploration and development. The agency's success on the Kenai Refuge can be partially attributed to the utilization of experienced personnel at the field (refuge management) level and the delegation of management and monitoring to these personnel. Additionally, Kenai Refuge stipulations allowed managers the flexibility to adapt requirements to local conditions, as exemplified by the progressive reduction of impacts from seismic exploration. These

managerial elements which characterized FWS' success on the Kenai Refuge should be equally applicable in other locations in Alaska.

Although Canadian experience cannot be rotely applied to the United States' Arctic, Canada's treatment of the seasonal drilling restriction does demonstrate the adjustment of mitigation measures to site-specific situations. This is a necessity because of the extreme variation in Arctic environments.

Present research is insufficient to evaluate the consequences of energy-related environmental impact on Alaskan Federal lands. Without this evaluation there is no assurance that costly measures which have been applied to reduce this impact have been effective. Arctic research itself is expensive and should be carefully planned. Proposals to stimulate and coordinate such research have been presented to the Congress. Several such proposals contain provisions to coordinate, prioritize, and fund Arctic research. Adoption of a proposal containing these provisions would help fill the research gaps identified in this and other reports.

WETLANDS PERMITS: DELAYS AND CONTROVERSIAL STIPULATIONS

Corps of Engineers wetlands permits are subject to processing delays which increase costs of oil and gas exploration and development. Numerous extensions of time for agency comments on wetland permit applications and late public notices delay the issuance of permits needed for Alaskan oil and gas projects.

Memorandums of agreement with Federal agencies require justification for time extensions. Since these memorandums were signed, the number of extensions granted without justification has decreased. However, no memorandums of agreement with the State, the main recipient of extensions, exist which provide that the need for the additional time be documented. Thus, wetlands permits will continue to be delayed unless time extensions to agency comment periods cease to be granted automatically.

Delays in issuing public notices accounted for part of the overall delay in issuing wetlands permits. The problem identified in Alaska is similar to findings reported by us in other Corps districts in 1980. Our 1980 recommendation, however, that the Corps keep track of public notice issuance times in order to identify and react to delays has not been implemented in Alaska.

In addition, the Corps does not require that Federal and State agencies document the need either for proposed stipulations or the absence of stipulations with site-specific data and pertinent research findings. Thus, controversial and costly permit conditions are imposed with little scrutiny on the part of the permitting agency.

RECOMMENDATIONS

To promote environmentally sound and cost-effective approaches to energy exploration and development in Alaska, we recommend the following:

- In its consideration of S. 1562 and other related proposals, the Congress should provide for three critical elements: coordination, prioritization, and sources of funding for research evaluating the impacts of energy development in the Arctic. Conceivably, a small portion of the revenues derived from Federal leasing of offshore and onshore lands on the North Slope could be set aside in a special trust fund for that purpose. Appropriate congressional controls could be maintained by requiring disclosure of planned expenditures as part of the budget process.
- The Secretary of the Interior should utilize existing research findings and site-specific data to the maximum extent possible and--after a source of further funding is worked out--direct and use additional site-specific research in the application of stipulations to future Alaskan energy projects. This should include using such data as a basis for determining whether the seasonal drilling restriction should be continued as a general stipulation for individual tracts.

In addition, to expedite the issuance of wetlands permits, we recommend that the Secretary of the Army

- only grant the State of Alaska extensions to the public comment period when they are adequately justified and that research findings and site-specific data be used to the maximum extent possible in determining the need for proposed stipulations in future permits;
- require that Federal agencies support the need for proposed permit stipulations to the maximum extent possible with site-specific data and relevant research findings; and
- direct the Chief, Corps of Engineers, to have the Corps' Alaska District management periodically summarize the time required to issue public notices and enforce the 15-day time frame established by law.

AGENCY COMMENTS

Comments on a draft of this report were received from the Department of the Army and the Department of the Interior. Their comments are analyzed below. The Army's comments are in app. I. Because of the length and nature of Interior's comments, they--along with our evaluation--are summarized below, but detailed responses have been annotated on the full text of their letter (see app. II).

Department of the Army

The Assistant Secretary of the Army for Civil Works expressed general support for our recommendations regarding permit delay and unsupported stipulations. We proposed, in our draft, that Army negotiate memorandums of agreement with the State of Alaska and Federal agencies to solve these problems. The Assistant Secretary suggested that rather than negotiating changes to memorandums of agreement, we recommend that Army develop policy to assure that time extensions and proposed permit stipulations be justified. We believe this to be a more direct and better approach, and have consequently reworded our recommendations.

Army also stated that our report should recognize that the Army has conducted research applicable to Alaska and maintains considerable research capability, especially in its Cold Regions Research and Engineering Laboratory (CRREL). We agree that CRREL should be identified as conducting ongoing research on NPRA, and have made this addition to our report. Our analysis of ongoing research led us to conclude that more research is necessary, particularly in the biological and societal impact areas. Existing research was considered in reaching this conclusion, specifically with regard to NPRA. In addition, we interviewed CRREL personnel in this regard. Our report does not criticize the quality of research being conducted--it finds there is a need for more.

The Army stated that creation of a State agency to coordinate wetlands permits might have disadvantages, such as lengthening process time, as well as advantages. We did not intend to suggest the need for creation of a State of Alaska lead agency to coordinate wetlands permit applications. We believe the Corps can reduce State-caused delays simply by requiring that time extensions for commenting on permits be adequately justified.

In addition, the Army commented that the report does not give consideration to programs administered by the State which are outside their control and contribute to delays in Corps permitting. While our report recognizes that State actions do contribute to the problem, it also points out that the Corps has automatically granted comment time extensions to the State because of water quality and coastal zone program requirements. Thus, we believe the Corps' passive policy has encouraged this delay and that the Corps' implementation of our recommendation requiring justification for time extensions would change the situation.

The Army advised us of a procedural change which it states has shortened permit processing time--its joint publication of the State's public notices on permit applications required by section 401 of the Clean Water Act and the Coastal Zone Management Act. We verified the change, and it should be advantageous. We cannot verify that this action has saved 15 days, however, since it was taken subsequent to our review of Corps permits.

Further, the Army commented that multiple public review periods, resulting from a single permit application, cause delays in permit issuance. This comment apparently supplements our finding that the Corps' Alaska District has not, on the average, issued public notices within the 15-day period specified by law. Alaska Corps' personnel verified that processing backlogs cause delays in issuing public notices. We cannot verify the extent to which delays were also caused by the multiple public review periods cited in Army's comments. We agree, however, that this is undesirable and support the intention to reduce this practice.

Finally, the Army stated that the report should recognize that it is the Environmental Protection Agency, not the Corps, which has responsibility for transferring wetlands permitting functions to the States. This change has been incorporated in the report.

Department of the Interior

In general, the Interior commented that our report

- ignores their research directed specifically to the problems addressed by our study;
- emphasizes monetary costs, and ignores possible benefits resulting from environmental impact mitigation measures; and
- fails to credit them for efforts to tailor stipulations to site-specific requirements, and to provide field staffs with authority to modify stipulations as appropriate.

Our report does not ignore research specific to the problems addressed. We analyzed Interior's, and other, research conducted with regard to NPRA and the seasonal drilling restriction. For example, we identified 27 NPRA-related research projects, including the Cold Regions Research and Engineering Laboratory (CRREL) research mentioned specifically in Interior's comments. We utilized this information, updated by discussions with CRREL, BLM and Geological Survey personnel, in our analysis. We did not consider it desirable to list the specific research projects being conducted. Such a listing would have been unwieldy and of limited utility.

In addition, with regard to the seasonal drilling restrictions, the bowhead whale research specifically mentioned by the Interior also was considered in our analysis. Interior seems to be maintaining that this research is conclusive. We disagree, and conclude more needs to be done to adequately address the seasonal drilling issue. Thus, our findings that more research is needed with regard to these two extremely important energy-impact questions, plus a similar finding with regard to the Trans-Alaska pipeline in a previous report--lead to our conclusion that the need for such research is widespread. Studies by scientific groups, such as the Polar Research Board, support our conclusions--as do some of Interior's comments. For instance, Interior agrees that there is

a need for additional site-specific research, and research regarding habitat types, onshore leasing and development, and physical, biological, and societal impacts on NPRA.

In addition, Interior's comment that the report ignores possible benefits resulting from environmental impact mitigation measures is similarly unfounded. The discussion of the seasonal drilling restriction, for instance, cites reasons for its imposition--all of which are potential benefits. As stated in the report, these reasons include minimizing disruptive effects of human activity on fish and wildlife resources, and avoiding harmful environmental effects of oil spills. Additionally, with regard to the Kenai refuge, the report illustrates the benefits that mitigation measures have had there.

Also, we do not agree with Interior's comment that the report does not credit them for tailoring stipulations to site-specific requirements, and providing field staffs with authority to modify stipulations as appropriate. In fact, the report specifically credits the Interior with these actions on the Kenai refuge. The report concludes that these elements helped reduce negative impact on the refuge, and should be applied to future energy exploration and development activity in Alaska.

Two other Interior comments relate directly to our recommendations. Interior disagreed with our finding that costly permit conditions are imposed without substantial evidence that they are necessary. In fact, in 45 of the 111 wetlands permits reviewed, no supporting justification was given for the stipulations imposed. The permit issuing agency, the Corps of Engineers, agreed that such justification is needed. Interior also stated that the report recommended that research be directed only toward the seasonal drilling restriction. This is not the case. The report concludes that there is a widespread need for impact-related research.

In conclusion, we differ with Interior's assessment that we have not examined the pertinent facts, and that the report is inadequately substantiated and biased. Our findings regarding Arctic research are supported by our work, as well as by scientific groups and Interior itself. Our conclusions regarding permitting are based upon a statistical review. Interior does not refute the specific findings emanating from this permit review. Our evaluation regarding stipulations is based upon prior reports we have done on this subject and access to personnel (from industry, government and academia) on this assignment who are, or who have been, directly involved with stipulation development and compliance.



DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
 WASHINGTON, D.C. 20310

April 2, 1982

Mr. J. Dexter Peach
 Director, Energy and Minerals Division
 U.S. General Accounting Office
 Washington, D.C. 20548

Dear Mr. Peach:

This is in reply to your letter of March 1, 1982 to the Secretary of Defense regarding your draft report on "Alaska Energy: Federal Actions Needed to stimulate Research and Improve Permitting," GAO Code 008975 (OSD Case #5910).

As you may be aware, I chair a working group that has reviewed the Corps' Section 10/404 Regulatory Program and that has recommended specific reforms to the Presidential Task Force on Regulatory Relief. Currently, the Working Group's recommendations are under review by the Presidential Task Force, and I expect their decisions shortly. In the interim, I have directed the Corps to begin immediately to implement those in-house reforms that can be accomplished administratively.

Your report contains three specific recommendations to the Secretary of the Army concerning the 404 Regulatory Program. They concern: a Memorandum of Agreement (MOA) with the Governor of Alaska on State involvement in the permit program, revisions on MOA with other Federal agencies regarding permit stipulations, and periodic summaries by the Alaska District of the time required in certain phases of the program. The Corps of Engineers is already implementing procedures nationwide to improve and shorten the permitting process. Although I support the intent of your first recommendation that we enter into an agreement with the Governor of Alaska to require full justification of State requests for extension of the public comment period, I believe the issuance of appropriate policy guidance to the Corps would be just as effective and would be more efficient. Concerning your second recommendation, I also believe that this is best resolved by issuing policy guidance since the inclusion of permit conditions is within the District Engineer's discretion. I suggest that you rewrite these recommendations to reflect that the problems be resolved by changes in Army policy. Additional comments are provided in the enclosure.

Considering the efforts described above and other ongoing activities, I expect to see substantial improvements in our administration of the 404 program.

Sincerely,

William R. Gianelli
 William R. Gianelli

Assistant Secretary of the Army
 (Civil Works)

Enclosure

General Comments on GAO Proposed Draft Report
"Alaska Energy: Federal Actions Needed to Stimulate
Research and Improve Permitting." (OSD Case #5910)
(GAO Code 008975)

1. Research. The report should recognize that the Army has conducted research that is applicable to Alaska and maintains considerable research capability, especially in its Cold Regions Research and Engineering Laboratory. In addition, the Corps of Engineers' Waterways Experiment Station has broad expertise in the evaluation of environmental impacts associated with construction activities.

2. Permitting.

a. The report does not adequately take into account delays in permitting caused by factors outside the control of the Corps of Engineers. For example, the State administers programs for the issuance of State water quality approvals under Section 401 of the Clean Water Act as well as under the Coastal Zone Management Act. The requirements of these programs must be satisfied prior to final action by the Corps on a permit application.

b. At the present time, Alaska does not have a single agency designated as lead agency for coordinating applications for Corps' permits. If there were such an agency, there could be potential disadvantages as well as advantages. Having a single agency as a focal point or clearinghouse for State reviews could create an extra layer of review and lengthen process times. Nevertheless, such an arrangement could possibly provide a better forum for discussions among State agencies.

c. The Alaska District has adopted several procedural changes in order to shorten the permit processing time. For example, it publishes public notices for the State on permit applications as required by Section 401 of the Clean Water Act and the Coastal Zone Management Act, (then bills the State). This step saves about 15 days in processing permits.

d. In some cases, permit applicants use the Corps' public notice as a planning tool. This often leads to the dissemination of several public notices, each with its own non-concurrent review periods. The original proposal is gradually modified until it evolves into something that is perceived to be acceptable to the public. This approach, which occurs to a certain extent nationwide but is prevalent in Alaska, extends the permit processing time. We intend to reduce this practice.

e. The report is inaccurate in explaining the Corps' role in transferring portions of the 404 program to the States. The EPA has responsibility for determining State eligibility for assuming portions of the program and for making the transfer, not the Corps. However, the Corps is considering the use of General Permits for those States which have programs essentially similar to the Corps' regulatory program.



United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

APR 7 1982

Mr. J. Dexter Peach
Director
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Peach:

We have reviewed the draft GAO report on Alaska Energy: Federal Actions Needed to Stimulate Research and Improve Permitting. We do not believe that this report accurately reflects the existing situation in Alaska. Most notably, it ignores the extensive research promoted by this Department in the Arctic area and addressed to the specific problems identified in the report. The report ignores the positive efforts this Department has made to expedite the permitting processes, tailor stipulations to site-specific requirements and provide our field staffs with the authority to modify stipulations as appropriate. In brief, the report should recognize that we are identifying and initiating needed research and quickly incorporating the results into our management decisions.

(GAO's response: Our report does not ignore Department of the Interior research directed to the specific problems addressed by our study--namely, NPRA and the seasonal drilling restriction. Where appropriate, we have added to the report site-specific research cited in Interior's comment, even when it was beyond the scope of this report. The research conducted by Interior and by others on NPRA and the seasonal drilling restriction was considered but found to be insufficient in scope and quantity to answer the important environmental and social issues which energy development raises. We disagree with the implication in Interior's statement that it is identifying and initiating all needed research. While it was beyond the scope of our study to examine the entire universe of Arctic research, our findings with regard to two extremely important energy-impact questions in this report--plus similar findings with regard to the Trans-Alaska pipeline in a previous report--demonstrate that research gaps need to be filled.

In addition, the report does not denigrate the quality of ongoing research efforts--only concludes that more research is needed. Studies by scientific groups, such as the Polar Research Board, support these conclusions, as do some of Interior's own comments. For instance, Interior, in subsequent portions of its response, agrees

that there is a need for additional research regarding onshore leasing and development, regions or habitat types, and physical, biological and societal impacts on NPRA.

Further, the report does not ignore but, in fact, credits Interior--with regard to the Kenai refuge--with tailoring stipulations to site-specific requirements and providing field staffs with the authority to modify stipulations. The report concludes that this emphasis helped reduce negative impact on the refuge, and should be applied to future energy exploration and development activity in Alaska.

Moreover, our report does recognize improvements in the past years in the permitting process involving Federal agencies, including Fish and Wildlife Service. The target of criticism in our report is clearly on delays in the wetlands permitting process administered by the Corps of Engineers and mainly involving the State of Alaska. The Corps recognizes the need for improvements here and has indicated that corrective measures will be taken.)

We feel that this report falls short of its objectives to analyze the effectiveness of the measures designed to minimize energy development impacts to the Alaskan environment and to help assure that Federal Agencies will advance environmentally sound approaches to energy exploration and development without unnecessarily increasing energy costs. The report appears to reflect only the costs of environmental protective measures as projected by industry. There is no attempt to balance this discussion of the costs to industry with an analysis of perceived or real benefits to the environment by imposing the protective measures used as examples in this report. Therefore, it is impossible to conclude whether the measures discussed were indeed cost effective or just, as implied, costly.

(GAO's response: Contrary to Interior's assertion, our report was not intended to be a cost-benefit analysis. We presented arguments from proponents and opponents of measures addressed. We concluded that more research is necessary to make determinations regarding cost-effectiveness.)

The Congressional statements in support of recent legislation on energy development in Alaska (Alaska National Interest Lands Conservation Act, particularly) indicate an intense national concern for fish and wildlife values and for the cultural traditions of the Natives of Alaska. The considerations and constraints mandated by Congress are ignored by this report. In view of these comments, some of the mitigating measures that have been and will be required on Alaskan Federal lands should not be dismissed as inappropriate because of their cost, but rather should be evaluated in terms of the specific sensitivities of the landscapes, the magnitude (both in sheer numbers and distinct worldwide populations) of the fish and wildlife resources, and the relative intensity of native subsistence requirements in areas proposed for development.

(GAO's response: The report does not dismiss mitigating measures as "inappropriate because of their cost." We agree that the factors noted by Interior should be considered in the evaluation of such measures, and our recommendations for additional research would facilitate this evaluation. However, we do not believe monetary costs can be ignored, as Interior implies.)

Throughout the report the need for site-specific research is emphasized to substantiate requirements imposed upon industry. The report is a victim of the same lack of documentation which it ironically seizes upon as justification for (1) allegations of insufficient basis for past and present mitigatory requirements and (2) support for a greater need to expand the data base for energy related development activities in Alaska. The Fish and Wildlife Service (FWS) has an extensive record of site investigations on the North Slope and has championed the use of remote sensed data to extend the utility of site investigations. They have investigated on site more than 95% of all North Slope Section 10/404 sites. These individual site investigations rely heavily on the detailed biological studies of the FWS Special Studies office. We concur with the report's call for additional site-specific research, but the Service's track record of site-specific investigation and consideration of projects is excellent and should be so recognized.

(GAO's response: Interior's comment apparently refers to our discussion of the U.S. Army Corps of Engineers' wetlands permitting program and our recommendation that the need for agency-proposed permit stipulations be supported with site-specific data and relevant research findings. In 66 of the 111 Corps wetlands permits we reviewed, some site-specific justification was provided by agencies which proposed stipulations, including the Fish and Wildlife Service. This information has been incorporated in our report. However, 45 of the 111 permits lacked any kind of justification for the proposed stipulations on page 41. The U.S. Army Corps of Engineers, the permitting agency, agreed with our conclusion that additional justification for these stipulations is needed. Such support, including site-specific data and research findings, is particularly important because some of the imposed stipulations are of a "controversial" nature, e.g., seasonal drilling restrictions, pipeline animal crossings, and the impermeable disposal pit requirement.

Also, the report claims that several mitigation requirements were imposed without site-specific proof that such measures were warranted. This view fails to take into account that Alaska Arctic and Subarctic landscapes are unique in the mere fact of their wildlands nature. Development activities planned for Alaska are, in many cases, firsts; meaning that as some development activities and their anticipated impacts have not occurred before, their effectiveness and impacts could not have been observed or recorded. For example, the concept of a freeze back, self-sustaining thermal VSM for elevated pipe is in itself only experimental. The "frontier" nature and experimental aspects of energy development in Alaska needs to be addressed by this report.

(GAO's response: In fact, the report does recognize that Alaska is uniquely rich in wildlands resources and that unprecedented "experimental" mitigation measures have been implemented. The report concludes that research should now be conducted to determine whether these "experimental" measures should be modified.)

Cautious restraint on development activities should be continued to allow data accumulation on impacts and recovery rate information for future projects planned for Alaskan lands. The main concerns for Alaska relate to the long-term effects of and recovery rates from short-term energy projects such as those used in this report as examples. We direct GAO to one document in particular that will prove useful on this issue. It is called Arctic Terrestrial Environmental Research Programs of the Office of Energy Research, Department of Energy: Evaluation and Recommendations. Copies are available from the Polar Research Board, 2101 Constitution Avenue, N.W., Washington, D.C. 20418. This document summarizes current and projected Arctic-oriented environmental research programs highlights scientific findings, and recommends specific research directions to be pursued for addressing the issue of environmentally sound energy development in Alaska.

(GAO's response: We have reviewed the cited document--which was just recently published--and noted that it supports our conclusion that additional emphasis on Arctic research is needed.)

Some good research assessing long-term impacts of energy exploration has been done in the NPRA but is not mentioned in the report. This effort, supported by the Geological Survey and conducted by scientists associated with the U.S. Army Cold Regions Research and Engineering Laboratory, studied recovery of vegetation and soils approximately 30 years following the U.S. Navy oil and gas exploration program conducted in the NPRA between 1944 and 1953. Their observations and observations of others on the gas wells drilled near Barrow, Alaska, supports the hypothesis mentioned in the GAO Report that recovery may, in some situations, be most rapid when drilling muds are dumped on the tundra and not placed in dug pits.

(GAO's response: We reviewed research pertaining to NPRA, including that conducted by CRREL. We did not consider it desirable to report specific research projects being conducted. For instance, Arctic Environmental Information and Data Center (AEIDC) Current Research Profile for 1980 shows 27 research projects relating to NPRA, including the CRREL research mentioned above. As disclosed in our report, we utilized this information, updated by discussions with CRREL, BLM and Geological Survey personnel, in reaching our conclusion that research gaps exist which need to be filled--existing efforts, including CRREL's, notwithstanding. Our report does not criticize the quality of CRREL's or other extant research--it concludes that more is needed. Interior agrees with this conclusion.)

We believe a distinction should be made between onshore and offshore research needs. A considerable amount of research addressing impacts of offshore leasing and development has already been conducted (particularly through BLM's OCS Environmental Studies program), and additional data requirements are addressed in the 5-year study plans prepared for that program. Onshore research has been less comprehensive, and the need for more data is acknowledged. Equally important, however, is the need to interpret the data and provide for application of the findings by all parties involved in energy development.

(GAO's response: We do not agree that onshore, vis-a-vis offshore, research should be emphasized merely because more offshore research has been done to date. Research should be related to the areas being, or likely to be, impacted. An accelerated OCS leasing schedule, including Alaska, may indicate a continued need for emphasis on offshore research. Interior's statements here seem to imply a need for research prioritization and coordination--which is one of the report's conclusions.)

While we agree that coordination of research efforts is very beneficial, we would suggest that existing mechanisms (e.g. the Interagency Committee on Ocean Pollution, Research, Development, and Monitoring for offshore studies, as well as the National Academy of Sciences) be reviewed and recommendations made to improve their effectiveness and assure comprehensive coverage of all research efforts instead of creating additional mechanisms.

(GAO's response: Our recommendations do not preclude further study in this regard. Studies of this matter have been conducted, including a current one by the above-mentioned Polar Research Board, which favor an "additional mechanism." Another possibility, however, would be to work with existing mechanisms--for instance, by establishing a lead agency. Our work identified a need for coordination, prioritization, and funding of Arctic research. There are several ways, identified in the studies mentioned in the report, that this might be accomplished. It was beyond the scope of our report to compare these methods or, for that matter, to advocate creation of an additional mechanism.)

Although the need for site-specific research is stressed in the report, it should be pointed out that cost and scientific manpower, even in the best of times, would be inadequate to fund the necessary long-term research at each lease or well site to the extent needed to evaluate potential environmental impacts. We assume, therefore, that "site specific" is used in a broad sense and refers to regions or habitat types (e.g., arctic coastal plain, arctic foothills alpine tundra riparian communities, etc.). If this is the intent, we agree with the report's conclusion. Only through long-term research in each of Alaska's major ecological communities can the knowledge of long-term population dynamics and ecosystem functioning be acquired that is necessary for the understanding of potential impacts of energy-related activities (at specific sites of energy development).

(GAO's response: "Site-specific" in this context does refer to habitat types or regions.)

We agree with the GAO Report that the wetlands permitting requirement and the procedures followed by the U.S. Army Corps of Engineers need to be reviewed. Certainly, all wetlands are a valuable national resource. In the contiguous 48 States they are less extensive in area. Much of the State of Alaska is underlain with permafrost so that surface water cannot drain into and through the soil as it does further south. Moreover, because of the cool temperatures, evaporation is also reduced. As a result, the extent of wetlands in terms of the accepted definition is much greater (perhaps as much as 85% of the State) and much less is known about their character. This situation, because of the magnitude of the problems which the wetlands potentially pose (and which are posed to them in turn), certainly justifies increased research efforts. The issue of wetlands identification and classification, and permit criteria in Alaska needs prompt attention by both the Federal Government and the State of Alaska.

Overall, the report appears to have been prepared in a haphazard manner without a thorough examination of the pertinent facts. It appears that those involved in the interviewing process for GAO formulated opinions prior to the interviews. Many sections of the report are not substantiated; rather, they appear to be based on conjecture by the authors. Several sections of the report, especially those dealing with seasonal drilling stipulations and wetland permitting, are biased and ill-founded. We do not believe the authors understand the relationship (interplay) between general and more site-specific stipulations, nor do they understand the stipulation enforcement and compliance process.

(GAO's response: We disagree with Interior's assessment that we haven't examined the pertinent facts. Our conclusions were not preconceived, either in interviews or elsewhere. We maintain that the report is well substantiated. Our findings regarding Arctic research are supported by our work as well as by scientific groups and Interior itself. Our conclusions regarding wetlands permitting are based upon a statistical review of all petroleum-related permits issued in Alaska over a 20 month period. Interior does not refute the specific findings emanating from this permit review. Our knowledge regarding stipulations is based upon prior reports we have done on this subject and access to personnel (from industry, government and academia) on this assignment who are or have been directly involved with stipulation development and compliance.)

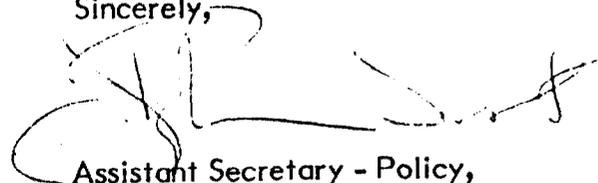
Furthermore, to compare industry performance on the Kenai Refuge to that on the northern coast of Alaska is inappropriate, both temporally and technologically. The report should be revised to reflect a more objective assessment of present conditions in order to provide a correct perspective for developing recommendations on needed federal actions.

(GAO's response: The report recognizes the substantial differences between the Kenai refuge and northern Alaska. The report concludes, however, that certain management characteristics and philosophy which prevailed on the Kenai

refuge can be productively applied elsewhere. These included two factors which Interior states it is taking positive steps to apply-- tailoring stipulations to site-specific requirements and providing field staff with the authority to modify stipulations as appropriate.)

Additional specific comments are attached for your consideration. We appreciate this opportunity to review this draft report and hope our comments will prove useful to the GAO in preparing their final report.

Sincerely,



Assistant Secretary - Policy,
Budget and Administration

Enclosure

SPECIFIC COMMENTS

Page i-ii- It should be emphasized that there has been no development in NPRA, only exploration. Development of stipulations for the two processes is quite different. The statement in the third paragraph is interesting from the standpoint that many regulatory agencies are constantly searching for general permitting conditions so they can reduce case-by-case investigations and also reduce time and cost in carrying out their regulatory functions. We suggest the authors more thoroughly examine the progress that has been made in the issuance of general permits on the North Slope and those proposed for several communities within Alaska.

(GAO's response: Our review included the oil and gas-related general permits mentioned in Interior's comment. We recognize and discuss in the report the value of general permits in reducing agency workload and shortening permit issuance time. However, we are opposed to the imposition of controversial stipulations in a "blanket" manner - whether through general permits or otherwise.)

Page iii - Section 404 permits were not required on Phase II and III Wetlands on the North Slope until January 1979. The application of the program by all agencies involved has been an extremely dynamic one. Many of the issues raised in the report have long been recognized by agency staff involved; efforts have been made by all parties to respond in as timely a manner as possible. The report does not elaborate on the administrative difficulties of applying a realistic permit review process to the remote and weather dominated North Slope.

We disagree with the comment by GAO that costly permit conditions are imposed without substantial evidence. The FWS has routinely requested seasonal drilling restrictions on offshore artificial islands, on natural islands, and on some locations onshore in river deltas or other sensitive or remote sites immediately adjacent to the Beaufort Sea. This request is based on industry's admitted inability to get to a site with relief-well drilling equipment or remove oil from the sea during spring breakup. At these same locations we have requested that waste disposal be at a location approved by the Alaska Department of Environmental Conservation, usually onshore. Pipeline height stipulations have all been the result of intense discussions with Alaska Department of Fish and Game research biologists, with the need being fully justified in each case. The history and need for pipeline height requirements are readily available and well documented.

(GAO's response: Interior states that FWS has "routinely requested seasonal drilling restrictions* * *". Our report concludes that the application of such measures should not be routine, but should be based upon careful analysis, on a site-specific basis, of the relative costs and benefits involved. More research is needed to make these types of determinations. Industry maintains that the probability of an exploratory well blowout is very small, that the relief well arguments used by seasonal drilling restriction proponents are without merit, and that no such

See GAO note on p. 61.

restriction, or considerably less lengthy ones, are needed. Nevertheless, there is a question about whether industry could go to a site to drill a relief well--with or without the seasonal restriction. This issue remains controversial. The point of Interior's comment on waste disposal location is unclear; our report addressed the requirement to make disposal pits impermeable. Likewise, the controversy surrounding the need for elevated pipeline animal crossings (pipeline height requirements) was treated in detail in our report entitled "Trans-Alaska Oil Pipeline Operations: More Federal Monitoring Needed" (Jan. 6, 1981; EMD-81-11).

Chapter 2 - Kenai NWR - Page 5 of the GAO report cites FWS sources as painting a harmonious, "no problem" picture of the Kenai NWR oil and gas experience. This is a result of a misinterpretation in part, and taken out of context in at least one instance. The Chief, Division of Refuge Management in his conversation with GAO attempted to convey that although there is a broader perception among government and industry that the Kenai relationship is regarded as a "model", it is not because of the absence of problems but because of the way in which the Service, other bureaus and industry have been able to communicate. It is important to recognize that although there have been commendable successes there have also been notable difficulties and in many cases failures at Kenai. There has also been an evolution of minimizing oil and gas impacts on Kenai; the very earliest impacts were quite severe and have improved to the point where now they are not as severe. Nevertheless, any assessments of this sort are quite subjective due to the lack of documentation of impacts.

While full credit must be given to the Kenai Refuge staff for imposing environmental safeguards during oil and gas exploration, development and production within the refuge, the Kenai Refuge cannot be used as a typical example for the remainder of Alaska.

At the time oil and gas activities were occurring on the refuge, many of the present day federal/state environmental laws had not been enacted. It is unknown if many of the oil and gas activities initially permitted would be allowed today (e.g., blading vegetation, shrubs, trees for seismic exploration).

No site-specific research has ever been conducted on any oil and gas developments on the Kenai National Wildlife Refuge. No funds have ever been made available to conduct such research. Limited research, which has been conducted on the refuge related to management purposes and not to oil and gas related developments, has shown the following: a) A five year wolf research report recently completed which covered the entire Kenai Refuge area showed that wolves avoid the oil and gas development areas, although they were found to use outlying areas surrounding the oil and gas development; b) brown bear avoid the development areas although they use surrounding undeveloped areas; c) at least one bald eagle nest abandonment is directly related to the oil and gas developments; d) fishery related water quality monitoring on the Swanson River passing through the major oil and gas field developments has documented oil pollutants on several occasions; and e) thousands of acres of spruce timber have been killed by spruce bark beetle on the refuge. The major outbreaks are thought to have occurred as the result of seismic line clearings which provided down and dead timber as nursery areas for the bark beetles.

Page 7, 9 - The comments presented by GAO that the Service has been able to minimize impacts should be put in a realistic perspective. We do not know the extent to which impacts have been maximized or could be minimized because we have never had the funds or personnel to monitor or document these impacts. We can only make statements based on judgements such as "the refuge still has moose" or there are "still fish in the streams." This does little in speaking to the compatibility of the oil and gas activities to the overall purpose of the refuge.

(GAO's response: Our report does not state that energy development on the Kenai was problem-free, rather that actions taken by FWS lessened the severity of problems which did arise. It recognizes, verbally and with pictures, that harmful environmental impacts have occurred on the Kenai refuge and states that this impact was significantly reduced. The negative environmental impacts mentioned in Interior's comments were discussed in our draft and have been supplemented with an additional impact, the displacement of species, as a result of Interior's comments. We agree that Kenai is a "model", not because of the absence of problems but because of the way in which the problems were dealt with by FWS and other personnel. Although we agree with Interior that the precise extent to which impacts have been minimized cannot be quantified, we believe there is sufficient evidence to conclude they have not been "maximized.")

Page 15, 5th paragraph, 1st reason - Language should be added, "...which might occur during open water periods or during breakup or freeze up when ice infested water virtually guarantees ineffective clean up."

(GAO's response: Appropriate language has been added on p. 15.)

Page 15 - Another critical reason for requiring winter-only drilling onshore is transportation. Only during the winter can temporary airstrips be built at reasonable cost, and over-the-ground movements be accomplished without long-lasting damage to the tundra environment. All-season drilling enters cost considerations when drilling depths are in the order of 10,000 to 11,000 feet, even though such depths can be reached in a single winter drilling season. However, should the target depth reach the order of 20,000 feet, more than one winter season will be required to complete the drilling. Under these circumstances, the costs of mobilization-demobilization and the loss of time more than offset the cost of year-round airstrip construction, an item which can easily cost \$10 to \$15 million.

(GAO's response: This reason for requiring winter-only drilling onshore has been added to the report.)

The report provides the wording of the Federal stipulation for offshore drilling which includes the statement, "This stipulation will remain in effect for two years following issuance of the lease." We believe GAO should be aware that the restriction was imposed for only two years and that evaluation of its continued use beyond the two years is presently taking place, both in regard to existing leases and in conjunction with future sales. The information from BLM's research program addressed elsewhere is an important part of this evaluation.

(GAO's response: This statement--inadvertently omitted in our draft--has been included in our final report.)

Page 15 , 5th paragraph, 1st reason - Language should be added, "...which might occur during open water periods or during breakup or freeze up when ice infested water virtually guarantees ineffective clean up."

(GAO's response: This is a duplication of an earlier comment.)

Page 17 - While the oil industry states that the added costs of exploratory wells reflect a greater degree of concern, we disagree. We believe the added costs are due to several factors other than solely "concern" as stated. During exploration, for example, the operator naturally proceeds slowly in analyzing the underlying geologic structure. Logging, which is not done during development, is a money consuming process essential during exploration. If unusual structures are encountered during exploratory drilling, many times the process is stopped while new equipment such as different drill bits are delivered. During exploratory drilling it must be remembered that the industry is starting from ground zero. That is, no infrastructure is as yet available. The cost of establishing this infrastructure should be recognized as one of if not the major cost, environmental concerns aside, of exploratory activity.

(GAO's response: Interior is commenting upon an industry statement that it takes many and costly precautionary measures when drilling exploratory wells. The statement is used in our report to illustrate that the need for a seasonal drilling restriction is controversial, which Interior's comment further substantiates. We believe that additional substantive research would provide a basis for refining the requirement.)

Chapter 3 - The Canadian Experience - The statement (p. 18) that the Canadians' approach to regulations...could provide guidance for what should be done in the Alaskan Arctic fails to recognize the decision making impacts of the "Burger Report."

1. The inquiry held by Justice Burger underscores the many very serious environmental-socio-economic problems associated with the oil and gas development in the NW Canadian Arctic regions. The report resulted in a 10-year postponement of the decision to build a natural gas line through the MacKenzie Delta drainage, until environmental-socio-economic issues were fully assessed.

2. The Canadians do not have an "Endangered Species Act." Thus, the bowhead whales which spend the summer in the MacKenzie-Canadian Beaufort waters are not afforded the environmental safeguards such as those imposed in the U.S. Beaufort Sea area.

(GAO's response: Interior's response is unclear. However, if Interior's point in this comment is that the Burger report shows that there can be serious environmental and socio-economic problems associated with oil and gas development in the Arctic, we agree. A major theme of our report is that additional research is needed on those issues. We think Interior is unreasonable, however, if it is implying that the "decision making impact" of the Burger report is that 10 years of environmental and socioeconomic assessment should precede all Arctic projects. The MacKenzie gas pipeline faced legal, social, and political problems unique to Canada, including unsettled native claims. In response to Interior's second point on the bowhead whale, we realize that Canada does not have an "Endangered Species Act." We are not, however, in a position to comment in detail on the success of Canada's environmental safeguards for the bowhead whale.)

Page 18, last paragraph - To date, the seasonal stipulation has only been applied to operations occurring in Prudhoe Bay and east to Flaxman Island, a coastal distance of approximately 60 miles. The distance between the Colville and MacKenzie Rivers is over 300 miles. The seasonal stipulation has thus far been applied only to a restricted area which has a relatively uniform environment. Even though the discussion on this page does not reflect it, this would seem to be in keeping with the GAO's recommendation, found later in the report.

(GAO's response: Our point is that any drilling done within the entire lease sale area, constituting hundreds of thousands of acres, is subject to the seasonal stipulations. In addition, Industry advises that this stipulation has a "chilling effect" on bidding--that certain tracts, because of the additional expense foreseen, would not be bid upon at all.

The stipulation has only been implemented on certain leased tracts where drilling has actually occurred. Interior's statement that it has been "applied" only to coastal areas of approximately 60 miles has been added to the report.)

Page 19, 4th paragraph - A major facet of the seasonal drilling restriction question which the report fails to address is the input of the wishes and concerns of the local human population. This group represents a relatively powerful political entity which perceives the seasonal restriction as providing protection for maintenance of subsistence resources and life style. Members have publicly stated that they will immediately bring suit against the Secretary, as they have in the past, if the stipulation is removed or substantially modified. Precedent has already been set in that issuance of federal leases for the joint Beaufort sea area were delayed for six months over local concerns about the effect of the lease sale on Native cultural status.

Seasonal drilling should be analyzed in terms of onshore vs. offshore activities, and for exploration vs. development. The disturbance from onshore summer drilling in waterfowl nesting areas can be very disruptive and may be of more concern than potential oil spills. Seasonal exploration may be more cost-effective in some onshore locations because of the reduced need for gravel. In some critical areas it is considered prudent to defer the construction of environmentally damaging gravel roads, runways and pads until commercially viable discoveries are demonstrated.

(GAO's response: We agree there may be a need for additional research regarding seasonal drilling. This research would include the facets suggested by Interior: onshore versus offshore activities, and exploration versus development. Reasons listed in our report for seasonal restrictions include protection of fish and wildlife resources, resources which are important to the local human population for subsistence and cultural purposes. Interior's point regarding the political and legal aspects of this factor has been added to our report on p. 16.)

Page 20, paragraph 1 - Since 1979, the Bureau of Land Management (BLM) has been conducting an extensive scientific research program in the offshore Beaufort Sea coastal region. The emphasis of the research has been directed toward studying the endangered bowhead whale. In 1978, BLM requested an Endangered Species Act, Section 7 consultation with the National Marine Fisheries Service (NMFS). The purpose of the consultation was to examine the impact of the proposed Federal/State lease sale on the nearshore Beaufort Sea and to examine the status of existing information and proposed research. One element of the proposed research includes a determination of the "timing of movements and offshore distribution of bowheads through the proposed Federal/State lease area and adjacent waters." Accordingly, in 1979, BLM initiated research to determine the distribution, abundance, timing of migrations, and migratory routes of bowhead whales in Alaska waters. This research is in its fourth year and has provided information on the distribution and abundance of bowhead whales in the spring, summer and fall; timing of spring and fall migrations; and spring and fall migratory routes. This research has provided information to decisionmakers in determining the effectiveness and necessity for the "drilling window" concept. Specifically, the research indicates that the westward bowhead migration begins in September and generally is over by early November. In addition, a portion of the migration takes place near the Federal/State lease area. The spring migration takes place far offshore

after the bowhead whales have passed Pt. Barrow. Three years of aerial surveys in and near the Federal/State lease area in the summer have indicated that bowhead whales do not inhabit this region in the summer.

(GAO's response: The BLM/National Oceanic and Atmospheric Administration (NOAA) research referred to was taken into account in our analysis of the "drilling window" situation. As Interior points out, the spring migration is not believed to be in conflict with near-shore Beaufort Sea drilling. However, summer and early fall movements of the bowhead whale do take place in this nearshore environment. Knowledge of these movements and the behavioral patterns of the animals is certainly not sufficiently conclusive to factually support either side of the seasonal restriction issue. The factual discussion above has been added to the text on pp. 19-20.)

Page 20, 2nd paragraph, 1st sentence - Discharge of drilling wastes is now allowed upon sea ice on a case-by-case basis.

Page 20 - All resource agencies agreed to an experimental on-ice disposal of drilling muds and cuttings which were not oil contaminated at Sohio Delta 7 and 8 artificial gravel island wells during the 1980-81 drilling season. Monitoring by the applicant's consultants indicates excellent dispersal at these locations. Subsequent permit reviews have not requested backhaul where ocean currents would satisfactorily remove muds away from sensitive areas such as the kelp beds of the Beaufort Sea boulder patches.

(GAO's response: The report deals only with the onshore waste disposal requirements, not with the offshore requirements which Interior's comments address. Onshore disposal requirements were of significance to us because they are part of the Corps of Engineers' general wetlands permits for Alaska's North Slope. Nevertheless, we recognize this type of research is important and valuable within the scope of our recommendations for more site-specific research. Therefore, to try and give this research effort the proper recognition it deserves, we have incorporated their comments on p. 22.)

The Service has requested that all flare pits and reserve pits be rendered impermeable by a design of the applicant's choice. ARCO's engineering data for the buried-in-the-road pipeline concept first proposed for the Kuparuk oilfield showed that roads and other pads thawed by mid-August, thus refuting industry's claim that pit walls constructed of gravel placed on the tundra were impermeable to oils and other hydrocarbons in the pits. There have been several recent failures of production reserve pits in Prudhoe Bay pads, most significantly at Sohio Pads C and E. Sohio is now engaged in a voluntary retrofit program to render reserve pits impermeable. Production reserve pits often contain toxic chemicals used for well cleaning and testing.

In 1976 the reserve pit at the East Teshekpuk exploratory well in NPRA gave way and discharged into the lake because the berm was constructed of ice rich material.

The Service considers these stipulations on a site-specific basis. Earlier requests to require Exxon to line reserve pits at Pt. Thomson wells were withdrawn after the applicant explained the reserve pit would be excavated below ground and the top level of the reserve pit muds could be kept below the thaw zone by discharging excess muds down the well annulus. The Service does not request stipulations to render emergency relief pits impermeable because of the small likelihood they will be used for discharge, provided any hydrocarbon discharges are removed within 48-72 hours during the summer and as soon as practicable in winter.

(GAO's response: We recognize that disposal in impermeable pits may be the best solution in particular instances. Interior's discussion of drilling waste requirements indicates a movement toward applying such requirements on a site-by-site basis. We incorporated this information in the text on p. 26. However, as the report notes, the recent Corps of Engineers' general permits for Alaska's North Slope contain this requirement. This "blanket" treatment precludes the possibility that no pit at all may be the best in some circumstances--a solution which Interior recognizes as a possibility elsewhere in its comments.)

Page 22 and following - The GAO report concludes that the bulk of NPRA research has been related to physical impacts and that research related to biological and societal impacts is inadequate. While we concur with this finding in general and believe that NPRA drilling has produced a wealth of site-specific, physical impact research by the USGS and others, other broader issues covering long-time intervals remain to be resolved. NPRA drilling sites were overdesigned in order to ensure environmental protection, but much research into minimum engineering design requirements to be cost-effective remains to be done. Sand and gravel supplies are a critical engineering need in many areas. Research into the geologic conditions controlling the distribution of these borrow deposits would have significant economic impact on construction costs in the long term. Locally, much has been done on permafrost, but larger regional controls are poorly understood and could have significant impact on solving long term water supply problems.

Thus, while we agree that biological and societal impacts need further research, basic geologic and hydrologic research is also needed to develop engineering design criteria and to solve engineering and other related development problems in the most cost-effective manner.

(GAO's response: We agree that continued physical (including geologic and hydrologic) research, as well as biological and societal, is desirable. NPRA demonstrates the need for research coordination and prioritization. Interior's statements regarding the need for NPRA research have been added to the report.)

Page 30, Extended Agency Comment Periods - It should be recognized in this discussion that delays are often caused by industry as well as the action agencies. These can result from failure to supply needed information or from last minute changes in the proposal.

Page 30-31- Most Service requests for extensions of the permit review comment period were based on a need for additional information from the applicant or because there were extensive negotiations underway with the applicant. Beginning with the interim general permits of March 1979 there grew an informal and cooperative atmosphere among resource agencies, the Corps and the applicants. Most requests for time extensions were verbal and kept the Corps informed of the negotiation process. In reviewing the permit review paper trail, what may appear to be agencies dragging their feet was instead agency staff working actively with the applicants to arrive at a mitigation proposal acceptable to all. In other cases the applicant had not yet supplied information requested by agencies, but the permit "clock" had run out on the Corps.

The report, however, failed to mention the significance of these ongoing negotiations and discussions. We believe that these discussions overall have benefitted the industry as well as the resource. All should be cognizant of the fact that we (industry and government) have only been involved in Section 404 permitting on the North Slope since January 1979. We submit that given the remoteness of Alaska's North Slope, coupled with a paucity of resource information, the 404 process has served as the basis for a forum through which industry and resource managers, be they local, state or federal representatives, have communicated their various missions in a spirit of openness and cooperation. A thorough examination of the record will indicate that industry and government have achieved the desired result, to allow for orderly development without undue environmental degradation. The process has been an educational experience for all parties. To suggest that the process should be altered drastically on the basis of less than factual information is not logical.

(GAO's response: Interior's comment addresses a nonexistent problem for Federal agencies. Most (80 of 91 total) time extensions addressed in this report related to State agencies, and were automatically granted by the Corps. The Army agreed with our recommendations that State requests for such extensions be fully justified. As stated in the report, Federal agencies--including the Fish and Wildlife Service--are required to justify such extensions and have generally done so.)

In contrast to Interior's statements, industry has typified the wetlands permitting process in Alaska as one fraught with costly delay. Our report shows that most petroleum-related wetlands permits which we reviewed were late. The Army advised that it is attempting to shorten the permitting process.)

Page 36 - As stated in the second paragraph, if the Corps requires site-specific data and pertinent research findings to document the need for proposed stipulations, it would seem that the reverse should also be required, i.e., site-specific data and pertinent research findings to indicate that proposed stipulations are not necessary.

(GAO's response: We agree that those opposed to stipulations should be required to document their case with site-specific data and research findings. We believe research should provide the basis for both proposing and denying stipulations. Appropriate language has been added to the text on p. 35.)

We concur with GAO's findings that there is a definite need for more studies in determining long term effects of energy development and that revenues derived from leasing of Federal lands is a good source of funding for such studies; however, this paper appears to be lobbying to use those funds strictly for further evaluations on the efficacy of one lease stipulation imposed in the Federal/State Beaufort Sea OCS Sale. We believe the issue at hand is the cost effectiveness of all mitigating measures imposed for environmentally sound energy development in Alaska and that the one offshore stipulation discussed would be evaluated within its respective parameters, not as the focus of such a suggested "Federal Research Coordination Body."

(GAO's response: In fact, the report recommends that Congress consider legislation which would provide for the coordination, prioritization, and funding for impact-related research. The report does not recommend that this research be limited to the seasonal drilling restriction. We, too, are concerned about the cost-effectiveness of all mitigating measures.)

Page 36, 1st recommendation - This should recognize that without input from the land management agencies as to need for and direction of the research, the product will be of little use in the decision process. Provision should also be made for State and industry as well as federal funding.

(GAO's response: Our recommendation does not preclude surface management agency participation, and such participation is indeed desirable. In addition, we agree that the State of Alaska and industry, as well as the Federal Government, should fund energy-related impact research. Our recommendation relates only to the Federal role. See also the following response regarding the mechanisms for coordinating this research.)

2nd recommendation - This should recognize the positive steps taken by this Department to initiate needed studies in the Arctic area - both onshore and offshore - to meet management concerns in regard to mineral development and environmental effects. The results of these ongoing studies are promptly applied to mineral operations in the field.

(GAO's response: Interior's existing research efforts are recognized in the body of the report and implicitly in the recommendation.)

deleted in final

Appendix II - The options cited were taken from a draft document by the Departments of the Interior, Defense, and Energy in response to P.L. 96-487. This document was modified considerably in its final form and, consequently, many of the GAO quotations are no longer applicable.

(GAO's response: The discussion of this matter in our report reflects the final version of this report.)

Moved to pp. 32-33 - Three general permits designed to cover 95% of all North Slope onshore oil and gas exploration and development Section 404 activities were issued by the District Engineer on October 9, 1981. The Service played a lead role in support and development of these permits.

(GAO's response: We agree with FWS's support of the Corps of Engineers general wetlands permits for oil and gas activity on Alaska's North Slope. Our report credits the Corps for using such permits in Alaska to reduce delays. Our review showed that processing time for general permits averaged 63 days, compared to an average of 152 days for "regular" permits.

Appendix III, deleted - The Office of the Federal Inspector is delegated the enforcement of Section 404 permit stipulations but is not delegated the coordination of Section 404 permit review for the Alaskan Natural Gas Transportation System.

(GAO's response: This appendix, dealing with the Office of the Federal Inspector for the Alaska Natural Gas Transportation System, was considered an optional part of the report and has been excluded. It should be noted, however, that the Office of Federal Inspector in Anchorage does in fact coordinate wetlands permit applications for the gas pipeline project.

Appendix III, deleted - It is stated that the OMB/Army review of changes to Corps of Engineers regulations was scheduled for completion in February 1982; we recommend that the final report include results of that review.

(GAO's response: The OMB/Army review results are not available as of the report's issuance.)

GAO note: The deleted comments related to matters which were discussed in the draft report but omitted from this final report.

NOTE: The following summations are discussions of the issues of "Offshore Drilling Mud Disposal" and "Seasonal Drilling Restrictions." These summations should serve to inject factual information into what has become a gross misinterpretation by GAO.

OFFSHORE DRILLING MUD DISPOSAL

The guidelines on offshore drilling mud disposal have primarily been established by the Alaska Department of Environmental Conservation (ADEC). The FWS has followed their lead in this issue on leases located outside the Joint Federal/State Sale area, and followed the recommendations of the Beaufort Sea Task Force (which contains a FWS representative) in the Joint Federal/State Sale area.

A monitoring study of winter disposal of drilling muds was required by the ADEC as part of the Water Quality Certification for SOHIO's Sag 7 and 8 wells. The FWS unofficially suggested a monitoring program in a letter to Roger Herrera dated April 16, 1980 that outlined their concerns and proposed study parameters. ADEC worked closely with the applicant and the consultant (NORTECH) in the subsequent design and review of the study. The results of this study showed a high dispersion of muds and cuttings placed on ice over deep water and in the path of river overflow. The question of toxicity was addressed in a general sense, which will allow adequate determinations for single well discharges. The results of this study are now used in a case-by-case determination of appropriate disposal methods for all offshore operations.

(GAO's response: Since our report focuses upon onshore, not offshore, drilling mud disposal, the information provided by Interior is not relevant.)

SEASONAL DRILLING RESTRICTIONS

Drilling restrictions were originally proposed for the Beaufort Sea Joint Federal/State Sale area by the State of Alaska and the Department of the Interior primarily because technology to clean up an oil spill in moving ice was not available. Additionally, the stipulation was to prevent disturbance of the endangered Bowhead Whale and other biota that seasonally use the area for critical life stages. This stipulation is currently under review by the State and the Federal government. The inability to clean up an oil spill in broken ice or in situations without year-round access has been the primary criteria for imposition of this stipulation. In coastal areas where seasonal use by migratory birds and caribou is exceptionally high, potential for disturbance has also been considered. Specific examples follow:

(GAO's response: The above comments regarding seasonal drilling restrictions largely duplicates information already incorporated in our report. Inclusion in the report of the detailed cases provided below would serve no useful purpose.)

Beaufort Sea 24
NPACO No. 071-OYD-4-790376

Mobil Oil - Gwydyr Bay

Access to the pad was by an ice road as per State policy (no permanent roads to exploratory operations) and was therefore seasonal. FWS requested an April 30 cutoff of drilling because of the proximity of coastal wetlands heavily used by migratory waterfowl and the area during the spring and summer is used by caribou for calving, feeding, and insect relief.

Beaufort Sea 27
NPACO No. 071-OYD-4-790402

EXXON - Point Thomson 4

Access to the Point Thomson area was by an ice road from Prudhoe Bay. FWS requested a May 15 cutoff of drilling because of seasonal access, proximity to coastal areas used during the spring and fall by migrating and staging migratory birds, and summer caribou use for insect relief.

FWS met with the applicant to discuss the season restriction and ultimately rescinded it for this location so that the applicant would not lose a drilling season. FWS staff was invited to visit the site during the summer to observe the operation and did so on three occasions. Flight corridors and altitudes were cooperatively established to minimize aircraft disturbance to waterfowl and caribou. Exxon did contract a study of disturbance at this site, which showed minimal disturbance to waterfowl and caribou at this site due to the summer drilling. The results of this study were used in the evaluation of other proposed operations in similar areas.

Beaufort Sea 80 and 81
NPACO No. 071-OYD-4-800015 and 16

EXXON - Point Thomson C-1 and B-1

Access to the Point Thomson area was by ice road. FWS requested the seasonal restriction for the reasons outlined above (the disturbance study was not yet available).

Season restrictions were also requested for Beaufort Sea 85 and 86, Beaufort Sea 106, and Beaufort Sea 116. These were all located on the coast or in deltas. The rationale for the stipulation was similar to those outlined above.

GAO note: Page references in this appendix have been changed to correspond to page numbers in this final report.

Part II

Administration of Oil and Gas Exploration and Development

in the

National Petroleum Reserve in Alaska - (NPRA)

June 1, 1977 to October 1981

by

David M. Hickok

October 1981

Introduction

Pursuant to the General Accounting Office's review of the development and effectiveness of energy related regulation on Alaska's federal lands, the writer was requested to submit an "analysis of and conclusions regarding the quality of the job Bureau of Land Management and U.S. Geological Survey have done on NPRA in mitigating negative environmental impact from energy-related activity" (emphasis added by author). Unlike the similar task given relative to the Kenai National Wildlife Refuge, no field inspection was authorized or performed. Instead, the writer was asked for his analysis based upon his knowledge of the history, territory, and current activities within NPRA gained over the past 16 years in personal travel and investigations within the reserve; in preparing reports and plans on and pertinent to the reserve, its resources, and people (see Appendix V); and in assisting the staff of then Congressman John Melcher (Montana) with the drafting of certain parts of the "Naval Petroleum Reserves Production Act of 1976" (Public Law 94-258) and its accompanying report. These involvements with NPRA (and its predecessor designation NPR-4) are also aided by a perspective of federal land management accumulated over the past 35 years.

Background

Activities of the BLM and USGS in managing the environmental impact of energy-related activity within NPRA commenced on June 1, 1977, following the authorization of the Naval Petroleum Reserves Production Act of April 5, 1976, (Public Law 94-258) transferring jurisdiction from the Secretary of the Navy to the Secretary of the Interior. The Act required continued oil and gas exploration (with certain areal and topical environ-

mental protection constraints), studies of the reserve, reports to the Congress, and additional less germane (to this report) requirements. Within the Department of the Interior, jurisdiction over activity and responsibility was divided between the BLM and the USGS by the Secretary; whereby BLM was given surface protection responsibility, but only over "uses not appurtenant to the petroleum operations," and the USGS, continuing the Navy's exploration program, was delegated responsibility for the drilling and seismic program including related surface protection requirements.

The dichotomy over Reserve operations was also apparent in the preparation of reports to the Congress authorized by Sections 105b and 105c of Public Law 94-258. In this situation, USGS was the lead agency in the Section 105b study "to determine the best overall procedures to be used in the development, production, transportation, and distribution of petroleum resources in the reserve." The BLM was the lead agency of a task force authorized pursuant to Section 105c "to conduct a study to determine the values of, and best uses for, the lands contained in the reserve, taking into consideration (1) the natives who live or depend upon such lands; (2) the scenic, historical, recreational, fish and wildlife, and wilderness values; (3) mineral potential; and (4) other values of such lands."

Importantly, as background, it should be noted that the Congress in its drafting of Public Law 94-258 gave to the Secretary of the Interior basic jurisdictional responsibility over the Reserve. No where in the congressional record of this Act is there indication that the Congress expected or intended any dichotomy of agency responsibility in land management, per se, although they fully expected that the President (Sec. 105b (1) and the Secretary of the Interior would utilize all available federal agency talent as well as that extant within the state of Alaska

and among Alaska Natives in planning and performing evaluations of operational development. In this regard, it should be remembered that both the House and the Senate were, about this moment in time, quite critical of Interior's USFWS/BLM joint management of the national game ranges - a classic example of the vagaries, non-objective aspects, and agency mission conflicts of alleged integrated bureaucratic land management.

In any event, the attitudes within the Congress during the winter of 1975-1976 were, to this observer, clearly opposed to any joint management of any federal withdrawn lands. Nevertheless, the Secretary in 1977 with authority over the new NPRA chose to delegate a dichotomy of responsibility for NPRA management (in direct response to bureaucratic pressures) and it is the quality of this joint responsibility that is examined in this report with relation to BLM/USGS mitigation of negative environmental impact from energy related activity.

Examination of the Land Management System

As stated earlier, the NPRA land management system has been one of joint responsibility between USGS and BLM for NPRA. However, in terms of environmental impact, per se, the action has all been with USGS, rather than BLM. In policy terms of reference, (ie. land management decision processes and evaluation of environmental impacts from operational activity) this has represented a major and significant departure for the USGS and, indeed, also for the BLM. This point requires amplification.

The role of the USGS historically in the "management" of federal lands, both in the public domain and on withdrawn lands, has been as scientific

advisor and technological supervisor to and for designated land-managing agencies, be they the BLM, U.S. Fish and Wildlife Service, National Park Service, or U.S. Forest Service. The record of the USGS as scientific advisor and technological supervisor relative to the physical and earth sciences and to the state and control of extracting technologies pertinent to minerals, surficial deposits, oil and gas reserves, and geomorphic change, whether historically or within a current sense of natural dynamic change, has been generally exemplary. Although, sometimes conservative in their analyses as a government entity, they have employed a cadre of scientists and engineers generally held in high professional regard by their peers in state governments, academia, and industry. As scientists and engineers they have evaluated for the traditional "land management agencies" the opportunities, liabilities, and values of surficial and sub-surface resources, whether in a marine or terrestrial environment, and have supervised oil and gas production operations on federal lands managed by the traditional land management agencies. For, perhaps, the first time in USGS history this role has been changed to that of de facto "land manager" on NPRA. Since the only major and obvious land management activity, in natural resource terms of reference, within NPRA is concerned with oil and gas development (notwithstanding peripheral and secondary interests in Alaska Native land transfers, boundary disputes, fish, wildlife, and recreational interests), the USGS has moved beyond the role of scientist and technologist to that of contractor, interpreter of environmental impact, and indeed regulatory enforcer. The BLM, although charged with surface management other than that appertaining to oil and gas operations, has in reality been relegated to an advisory, consultative role as are, for example, the U.S. Fish and

Wildlife Service and other Interior agencies. In effect the BLM has a land management responsibility and charge without portfolio. Thus, any quality judgement of the respective performance of USGS or BLM must be examined with respect to their real or pragmatic roles pertinent to NPRA management and administration.

Identification of Negative Environmental Impacts

The immediate questions in need of identification are: have there been, since BLM/USGS assumed NPRA management, any negative environmental impacts; are there any occurring now; and is there any comprehensive effort to study conditions surrounding possible long-range, not immediately observable, effects? Further, in examining these questions, it is, perhaps, well to divide environmental impacts into those of a physical nature (e.g. soil disturbance, site degradation etc.); those of a biological nature (e.g. fish or wildlife population and movement stresses, etc.); and those societal (e.g. curtailment or disruption of Inupiat subsistence hunting or fishing activity, recreational affects, etc.).

The recent (1977-1981) record of NPRA BLM/USGS management shows several instances of alleged negative environmental impact from petroleum exploration activities. In general, most, if not all of these reports, have to do with surficial disturbances in the vicinity of well sites, tracked vehicular activity on tundra, fuel spills, and gravel removal operations. As far as this writer is able to discern, these instances have all been minor in character and consequence.

One argumentative issue surrounds the need of the relatively large airstrips constructed in support of drilling activity, such as that at

the Ivotuk location. Questions asked in some quarters are: did the size of the airstrips exceed requirements for logistics and safety and thereby adversely impinge on area aesthetics; and could different technological approaches to airstrip construction have been used which would have reduced size and gravel requirements? With the possible exception of this issue, this writer believes that physical site disturbances of a localized nature are not significant issues in the "quality" of USGS exploration management of NPRA. In effect, the mitigation of negative physical effects is adequate to good, but perhaps not superlative.

Our measure of concern over negative environmental impact within NPRA generally may be found by an examination of research projects supported within the reserve. In summary, this examination indicates major concern with securing knowledge of the geologic resources and geophysical setting within the reserve, with surficial impacts upon soils, permafrost and vegetation, the chemical and hydrologic analysis of aquatic systems, and technologic and engineering investigations. As far as available information can indicate it appears that less than 25% of the investigatory effort, pursued by the USGS is related to obtaining knowledge necessary to mitigate negative impacts of a biological and cultural-societal nature which appertain to oil and gas exploration within the reserve.*

While, of course, only an indication of agency concern, this disproportionate allocation of effort to obtain knowledge needed for impact mitigation directly related to petroleum exploration activities seems to

* From analysis of AEIDC Current Research Profile for 1980 and discussions with USGS, BLM, and CRREL personnel.

reflect major concern with geologic/geophysical knowledge (a prime mission of USGS) and apparent physical site impact analysis rather than the more subtle and long-range impacts of a biological and societal nature. Additionally, the BLM is not engaged in any real substantive effort to develop a comprehensive understanding of these biological and societal impacts.

Just what this allocation of research or investigatory effort means, in terms of the GAO's question to the writer relative to the quality of BLM/USGS efforts in mitigating negative environmental impact from energy-related activity, can only be answered in a subjective sense. In that regard, it seems to me that (1) the research effort necessarily reflects USGS program domination in both funding and mission responsibility (in other words, USGS is using available funds to research those topics most germane in their minds to its mission and responsibility); (2) the BLM, with fewer dollars and largely assisted by FWS and NPS and the Alaska Department of Fish and Game, are pursuing those investigations which they can accomplish through mutual interagency accords and a priority allocation of insufficient funds; and, in summary, while the baseline gathering of physical knowledge is proceeding with some apparent holistic long-range view the examination of fish, wildlife, and societal and economic disruptions from changes in subsistence and other life patterns are suffering from lack of long-term research design, planning, and fiscal commitment.

Thus, if scope and direction of effort are any measures, these omissions argue that the quality of work by the agencies in understanding the more difficult aspects of environmental impact are below a desirable

level, at least as apparently envisioned by the congressional dialogue of 1975-1976 leading to the enactment of Public Law 94-258 and again in the compromises leading up to the 1980 passage of the Alaska National Interest Lands Conservation Act of 1980. For example, there is no long-range research planning on the structure and dynamics of Western Arctic caribou populations, range relations, and behavioral patterns over time or of fisheries, particularly within foothills aquatic systems, or in fish and wildlife Inupiat subsistence dislocation and change. There cannot, in this writers opinion, be any quality of effort without these and other similar considerations.

The cause of this disparity of work quality between the acquisition of physical knowledge as opposed to either biological or societal understanding logically rests in the dichotomy of responsibility given by the Secretary to BLM and to USGS.

Another measure of quality in environmental impact mitigation is also subjective. The most outstanding lesson from the Kenai National Wildlife Refuge experience in oil and gas management centers on the simple aspect that FWS, in that management, has employed field personnel over long periods who have been intimately knowledgeable of the territory they have managed. Their environmental acumen and concerns have been transferable to lease operators (whether in exploratory or production phases) on a direct one-to-one basis. As a result, both the wildlife managers of the Kenai and the cognizant oil industry officials have learned to communicate with each other and to compromise and adopt their concerns with mutual integrity. This situation does not exist on NPRA and the quality of management in the mitigation of negative or potentially

negative environmental effects is lessened. Simply stated, there cannot be sufficient quality of activity concerned with biological and societal effects without individuals in those fields of interest who thoroughly know the length and breadth of the NPRA environment, fish, wildlife, and peoples and who also can directly communicate with oil industry representatives. One obvious problem in developing expertise for NPRA management is reflected in the frequent turnover of staff personnel assigned to NPRA management and the constant need for educating these new employees on the Arctic environment, its resources, and people. The present lack of sufficient experienced personnel in the biological and societal fields, within either BLM or USGS, and the stipulation that only USGS personnel communicate with the industry assures poor quality of mitigation on these matters.

In summary, the quality of BLM/USGS work in the mitigation of negative environmental impact from energy-related activity on NPRA has, in this writer's opinion, been good to adequate in the realm of physical impacts but of poor to inadequate quality in biological and societal considerations. This disparity in quality is, in part, directly due to the dichotomy of responsibility established by the Secretary in the management of the reserve. Moreover, interagency consultations cannot equate with experienced on-the-ground responsible personnel.

Sufficiency of Research to Evaluate the Effectiveness and Necessity of Restrictions on Seismic Exploration within NPRA

The writer was also requested by the GAO to furnish an "analysis of and conclusions regarding sufficiency of research being conducted to evaluate the effectiveness of and necessity for restrictions on seismic

exploration on NPRA." It is difficult to answer this request only within the purview of the conduct of current research. For a decade and more, indeed back as far as NPR4 exploration in the late 40's and early 50's, we have experienced an evolution of thought based upon research, observational experience, and new seismic technology which has refined and improved seismic exploration techniques so as to derive improved geophysical data and to also minimize the environmental effects of such operations.

Current research activities within NPRA, particularly those under the general heading of "Impact Ecological Investigations in NPRA," headed by Dr. Jerry Brown of CRREL, are designed to evaluate long-term recovery to disturbance of vegetation, soils, and permafrost. This current effort is founded upon many years of previous work regardless of the surficial disturbance agent. Included as agents have been seismic operations, vehicular and surface effect transportation, well-pad sites, road construction and usage, and also natural phenomena. Additionally over time, particularly since about 1967-68, both industry and several government agencies have examined the effects of seismic operations on fish, birds, marine mammals, etc.

It is this writers opinion that this program of continual monitoring and analysis by both industry and government is sufficient. In effect there is a good body of knowledge on these matters and seismic effects should be quite minimal when existing prudent technology is utilized and biologically sensitive resources such as migrating whales, nesting waterfowl, denning animals, and critical aquatic habitats are avoided.

In the context of the Kenai experience as well as that of the North Slope generally, on-the-ground involvement and dialogue between local

experienced biologists and physical and social scientists with exploratory or production oil industry representatives is essential to the achievement of mutual understanding of different values and responsibilities. Only through such experienced communication can practical, common sense seismic or other oil field practices be achieved in the context of mitigating negative environmental impacts.

In addition, these dialogs must be held between industry interests and only one cognizant agency of land management responsibility if they are to be effective. Agency duplication in permitting (e.g. wetlands permits of the Corp of Engineers, etc.) or any other aspect of surface management must be avoided if industry is to be able to proceed efficiently and all governmental responsibilities effectively met. The dual agency NPRA responsibilities with regard to seismic effect mitigation are not desirable.

The only logical and effective management scheme for the future in NPRA, particularly as private competitive leasing and industry exploration proceeds, is one which contains the following elements:

1. Assignment of total and complete management responsibility for the reserve to the BLM just as other federally dedicated or withdrawn lands are assigned to the U.S. Fish and Wildlife Service, National Park Service, or U.S. Forest Service, etc.
2. Assignment of responsibility for only well site and drilling technology safety and environmental control to the USGS. USGS, additionally, to coordinate their responsibilities directly with BLM overall responsibilities.

3. Assignment by BLM of an appropriately trained and developed cadre of physical, biological, and social scientists and resource experts who are responsible to a single authorized BLM officer for the monitoring, investigation, and mitigation of environmental impacts from petroleum operations as well as other impact sources within the range.
4. Removal of alleged discrepancies between the Naval Petroleum Reserves Production Act of 1976, the Federal Land Policy Management Act of 1976 and the 1981 Interior appropriation Act, or other laws pertinent to BLM administration of the reserve by change or clarification in order to permit necessary operations in support of lease exploration and development and the avoidance of conflicting agency responsibilities.
5. Institution by the BLM of a plan for long-term environmental investigations with particular emphasis on biological and societal change together with a commitment for adequate funding.

Part III

Sufficiency of Research to
Evaluate the "Drilling Window" Concept

The writer was asked by the GAO to prepare an, "Analysis of and conclusions regarding the sufficiency of research being conducted to evaluate the effectiveness and necessity for the "drilling window" in its onshore and offshore applications."

Background

The so called "drilling window" concept involves the cessation of exploratory oil and gas drilling operations (and presumably, production drilling) from state, federal, and disputed Beaufort Sea offshore lease tracts between March 31 and November 1.

The rationale for this concept involves the following major factors:

- concern over potential oil spill effects during open water and ice breakup and freezeup periods;
- allowance for time to drill a relief well prior to spring breakup, should a well blow-out occur and be needed;
- minimization of disruptive effects of human activity on fish and wildlife resources when they are involved in reproductive periods in their life cycles and when present in most abundance; and
- that cumulatively this seasonal drilling concept provides necessary operational safety for "crucial environmental protection" and that this safety factor and environmental protection is in the public interest.

Analysis

The answer to the GAO question is simple. One, there is no current research being conducted to holistically evaluate the effectiveness and necessity for the "drilling window" concept either on or off shore in the Beaufort Sea coastal region. Two, there is no such overall research program being organized. Three, there are a few current ad hoc studies that may be applicable to such evaluation but they are not (as earlier stated) organized in any intellectual, problem solving mode.

Briefly, on-going studies applicable to the evaluation include:

- satellite imagery to analyze the year-to-year variability of spring break-up, particularly at river mouths and deltas;
- effects of noise upon bowhead whales during fall migration and upon ringed seals during pupping;
- acoustical studies of noise transmission in Beaufort Sea waters;
- continuing studies of ice behavior, structure, movements and forces;
- methods investigations of drilling mud and waste disposal;
- continuing research into caribou reproductive success in areas of human disturbance;
- investigations into species composition, seasonal abundance, and breeding of waterbirds to determine habitat use patterns of major species in varying wetland types; and
- probably other applicable investigations, conceivably useful to answering the generic question posed (ie. studies of currents, waves, storm surge incidence, meteorological variations, sediment transport, polar bear denning and distribution, etc.).

Beyond the question of on-going research and its application to the "drilling window" issue is the subject of existing cumulative knowledge. It would be remiss not to discuss such briefly.

Application of Existing Knowledge

Having said that there is no organized research effort "to evaluate the effectiveness of and necessity for the "drilling window" concept is not to say that a body of existing knowlege doesn't exist. Indeed there is considerable knowledge available. Troublesome is the fact that some knowledge supports arguments for the concept and some knowledge supports opposition to the concept.

Much of the available knowledge and its articulation is the result of experience and observation, compounded by individuals developing positions from different sectors of scientific or engineering experience and investigation. Thus, biologists speak with authenticity when they assert evidence of disturbance to fish and wildlife resources from human activities. There is a considerable body of general evidence on this subject. What is relatively unknown, and related to subjective thought, is the degree of such disturbance, the reality of effects upon the populations of specific species at particular times of year and within particular habitats.

Similarly, there is a body of knowledge and experience within the geologic and geophysical science communities and among oil field technologists that support contentions of the rarity of blow-outs, particularly in Beaufort Sea type structures and under currently utilized drilling technologies. The preponderance of evidence on this subject, in my opinion, supports the so-called industry view.

The question of oil spill effects in arctic waters during breakup, freezeup, or open water periods remains in the realm of speculation despite some laboratory and small scale field experiments and analyses. In my opinion, there is an inadequate body of knowledge to support the contention of either the biological community of interest, on the one hand, or the geologic/oil industry position, on the other. Both sides can only argue incompletely and unconclusively.

Conclusions

Any decisions on the future application of the "drilling window" concept can be refined by further research, particularly if comprehensively and holistically designed and if based upon a foundation of current existing knowledge. Such research should be continued. It will, however, take years of expensive and concerted effort to resolve the many facets of the issue in only a partially scientifically acceptable manner. Thus, the type of studies most useful to practical decisions need to be carefully ascertained. Even so, only partial decisions based upon research can be achieved.

The real problem surrounding the "drilling window" concept boils down to the differing value perceptives and responsibilities held by national and state governmental agencies, local peoples, the petroleum industry, and the conservation or environmental protection communities. Only political, public policy decision making processes can resolve this issue in the short run and then the achievement of any concensus is most unlikely.

There is also a practical problem. All across the Arctic from the Bering Sea to the Canadian Beaufort Sea there is a wide variation in

the average sea ice, shore-fast ice and river delta ice breakup and freezeup dates. Similarly, there are differences in the mean dates of insect emergence, fish and wildlife productive cycles, animal migrations, etc. Even on the Beaufort Sea coast, differences exist in these dates between the Prudhoe Bay area and either the Colville River delta to the west or the MacKenzie River delta on the east. Neither, the advocates of the "drilling window" concept or industry opponents will be served by adopting "drilling window" dates derived for one geographic area and applying them to another. In every case site specific information should be applied.

CONSULTANTS' QUALIFICATIONS

Mr. David M. Hickok holds a Bachelors of Science degree from Syracuse University's New York State College of Forestry. He has had extensive experience in wildlife refuge management and in Arctic science research. He has authored and co-authored numerous articles on resource development and environmental issues in Alaska. Currently, he is Director of the University of Alaska's Arctic Environmental Information and Data Center.

In his Federal Government career, he served as a refuge manager at several National Wildlife Refuges and as branch chief in the Branch of Refuge Operations and Branch of Planning for Wildlife Refuges. In addition, he was a congressional fellow and a Science and Technology Analyst for the Library of Congress. Since leaving the Government, he has had numerous positions, including Director of the University of Alaska's Sea Grant Program. In addition, he is active in numerous professional associations including: the American Association for the Advancement of Science; Alaska Ecological Reserves Council; the Polar Research Board, National Research Council, National Academy of Science, and Chair of the Alaska Council on Science Technology. Mr. Hickok provides expertise through service to various committees, including the National Petroleum Council's Committee on Arctic Oil and Gas Resources and the Alaska Eskimo Whaling Commission's Scientific Advisory Committee.

Mr. Hickok has assisted the General Accounting Office in an expert/consultant position on several reports. Recently, he assisted with the Trans-Alaska Oil Pipeline report (EMD-81-11, Jan. 6, 1981). In addition, he has been involved in the development and congressional consideration of S. 1562.

Dr. Andrew Safir holds a Bachelor of Arts degree in economics from the University of Colorado, and an MA and PhD in economics from Tufts University. He has extensive experience in the field of energy policy, having served as the Assistant Director of the Office of International Energy Policy at the Treasury Department, and in other Federal agencies such as the Department of Justice, the White House Staff, and the Council of Economic Advisors, where he dealt with energy economics issues.

Dr. Safir has been an advisor to the General Accounting Office Energy and Minerals Division since 1978, in an expert/consultant position. In this capacity he has helped prepare a variety of GAO reports, including those pertaining to such topics as the Alaska Natural Gas Pipeline, the Canadian national oil company (PetroCanada), the foreign tax credit as it pertains to the development of oil and gas resources by American companies abroad, international nuclear energy policy, and the potential and feasibility of Alaskan oil exports to Japan.

In addition to his GAO affiliation, Dr. Safir was, from 1978 until 1980, the Assistant Secretary for Economic Policy for the State of California. Since mid-1980, Dr. Safir has been the President of Recon Research Corporation, a firm specializing in providing macroeconomic forecasting advice, and economic analysis of energy issues to a variety of private sector clients, and State governments.

FEDERAL AND STATE AGENCIES
INVOLVED IN WETLANDS PERMITTING

As described below, several Federal and State agencies have roles in the wetlands permitting process. The flow chart on page 29 describes the process and identifies the agencies involved.

Under such laws as the Fish and Wildlife Coordination Act, the Marine Mammal Protection Act and the Endangered Species Act, the FWS reviews, comments, and recommends stipulations designed to protect fish and wildlife. The FWS sponsored 47 percent of the stipulations proposed for Alaska onshore oil and gas-related wetlands permits issued from February 1980 to September 1981. The National Marine Fisheries Service reviews and recommends permit stipulations to protect the offshore marine environment and sponsored only 4 percent of the stipulations proposed for onshore oil and gas-related wetlands permits reviewed.

The EPA reviews Corps wetlands permit applications and is responsible for determining State eligibility for assuming portions of the wetlands permitting process. In designating disposal sites, the Corps is required to apply guidelines jointly developed by EPA and the Secretary of the Army. Furthermore, EPA can prohibit the specification of a disposal site (or restrict its use) if EPA determines that the proposed discharge would have "an unacceptable adverse effect on municipal water supplies, shell-fish beds and fishery areas * * * wildlife, or recreational areas." EPA has not exercised this authority in Alaska nor does EPA often recommend permit stipulations. The agency accounted for only 1 percent of proposed stipulations for the permits we sampled.

The State role in wetlands permitting

The Alaska Department of Environmental Conservation reviews all projects affecting wetlands to ensure that State water quality standards are not violated. Before the Corps can issue a 404 permit, the Alaska Department of Environmental Conservation must grant, deny, or waive the certification for section 401 of the Clean Water Act. If it denies 401 certification, then the Corps cannot issue a wetlands permit. The Alaska Department of Environmental Conservation water quality certifications often contain special conditions. We reviewed 167 Corps wetlands permits and associated water quality certifications.

The Alaska Department of Fish and Game reviews proposed wetlands activities for possible impacts on fish, moose, ducks, geese, and other animals. The Alaska Department of Fish and Game also recommends stipulations for wetlands permits although not as often as the Alaska Department of Environmental Conservation. For example, only 14 of the 167 Corps permit files reviewed contained proposed Alaska Department of Fish and Game stipulations.

The Division of Policy Development and Planning is an agency within the Office of the Governor with various program planning, coordination, and development functions. As overseer of Alaska's Coastal Management Plan (ACMP), the Division of Policy Development and Planning determines if Federal coastal zone wetlands activities are consistent with State and local management plans. The Corps cannot issue a wetlands permit without a favorable consistency determination or a waiver. We reviewed 167 Corps wetlands permits and associated consistency determinations. Fifty-six consistency determinations included stipulations.

Under the current system, the State of Alaska's Division of Policy Development and Planning and Department of Environmental Conservation separately consider whether a coastal area wetlands permit application is consistent with ACMP standards. According to a 1981 State of Alaska Office of Coastal Management report on wetlands management in Alaska, this division of responsibility is likely to change with the adoption of State uniform procedures for permit reviews.

The Alaska Wetlands Task Force was established to assure protection of Alaska's wetland resources while preventing or minimizing unnecessary delay in project approvals. The task force consists of representatives from Federal and State agencies having legal responsibilities to review wetlands permits. Its quarterly meetings include representatives of environmental groups, private industry, and local government. It was established in October 1980 after the Senate Environmental Pollution Subcommittee held hearings on wetlands permitting.

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